

The Canadian Medical Association Journal



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The Canadian Medical Association Journal

VOL. VII.

MARCH, 1917

No. 3

FUNCTIONAL REEDUCATION AND VOCATIONAL TRAINING OF SOLDIERS DISABLED IN WAR

BY E. M. VON EBERTS

Surgeon to the Montreal General Hospital

THE responsibilities assumed by the allied belligerents in this war have increased in leaps and bounds; and, what is most remarkable, enthusiasm has kept pace with all demands, military and economic. Let us hope that this sense of responsibility and this great wave of enthusiasm will not end with victory, but will be wisely directed to the completion of the undertaking to deal justly and adequately with the human wreckage; to gather up, foster, and rehabilitate those fragments of the nation's manhood, that nothing redeemable may be lost to the state or to society.

In former wars the state held that it had discharged its whole indebtedness to a disabled soldier when it had granted him a pension. To-day political economists are convinced that something more fundamental and far-reaching is needed. The essential defect of the old system was that the majority of incapacitated soldiers subsequently, either from choice or from supposed necessity, lived in idleness. As a result, they were in many instances a permanent loss to the economic world. They became a burden either to their families or to the community, which had to make good in one way or another the difference between the pension and the normal living wage. Many of them ended by losing their self-respect and social standing. While recognizing that the payment of pensions must always be an issue of war, we have awakened to the fact that the evils which have hitherto been associated with the pension may

Presented to the Montreal Medico-Chirurgical Society December 15th, 1916.
Received for publication January 18th, 1916.

through a coördinated system of functional reëducation and vocational training, be largely eliminated. The old sentimentality displayed towards disabled soldiers, which quickly expended itself and left the recipient with a depleted stock of moral stamina, is giving place to the healthier and essentially more sympathetic view, that an incapacitated soldier can and must again become self-supporting, and that the state, in addition to giving him a pension, must provide the educational means for such an economic rehabilitation.

At this point it might be well to state that the present theory of the pension is, that it should merely span the gap between the normal wage and that which, in the opinion of the government, the disabled individual should command. It is in no way intended to replace the normal wage, except in cases of complete incapacity.

Civilian institutions for the reëducation of persons who have met with mutilating injuries have existed for many years in France, Belgium, Russia, Scandinavia, and Bavaria; and the astonishing results obtained serve to demonstrate, for the purposes of the present widespread movement in connexion with the reëducation of disabled soldiers, the truth of the dictum that, with the will and the means to overcome it, there is no special permanent incapacity inherent in the disabled.

Of the Allies, the French were the first to recognize the necessity of extending their organization for the rehabilitation of disabled soldiers. Owing to the extent and severity of the war, the needs of the nation in this respect were insufficiently provided for; and, while public and private energies quickly produced numerous bodies to meet these needs, it soon became evident that their functions would be fulfilled more scientifically and with less waste of energy, were a more coördinated system devised. With this end in view, various legislative measures have been passed; others are in contemplation; and it is confidently expected that the legislation and organization finally adopted will be ideal.

The French organizations (as then existing) were reviewed some months ago by Major J. L. Todd of the Pensions Commission; and the information which I have to lay before you this evening is based largely upon Major Todd's report to the Director of Medical Services, Canadian Contingents, entitled "How France Returns her Soldiers to Civilian Life".

Since the necessities of the case are identical, Canada is, like Italy, Germany, and Austria, following the principles embodied in the French organizations.

The process of rehabilitation may conveniently be divided into the following stages:

1. Active medical and surgical treatment.
2. Functional reëducation.
3. The provision of artificial appliances.
4. Vocational training.
5. Establishment in civilian life.

We shall be concerned chiefly with the complementary phases of functional reëducation and vocational training, and with the question of artificial appliances.

By "functional reëducation" we mean the various measures adopted to secure a maximum of normal function in an injured part; and by "vocational training", the instruction given to disabled men to prepare them for the occupations which are most in accord with their aptitudes and social circumstances.

While functional reëducation and vocational training, which must often be coincident, can not in some instances be begun before the termination of active hospital treatment, no considerations of administrative convenience should be allowed to interfere with their commencement at the earliest possible moment in the course of a patient's progress. A mistaken sentiment is that which fosters the belief that disabled soldiers should be allowed to return to their homes as soon as hospital treatment has been completed, and before they have undergone a course of reëducation. This tendency should be strenuously combatted, and perhaps the best means of so doing is to grant the pension, where feasible, before vocational training is begun. Those who are responsible for vocational training in France, Germany and Austria, are convinced that it is inadvisable to permit a disabled soldier to return to his home before he has undergone reëducation. There are, of course, exceptional cases, in which, owing to the possession of independent means or the peculiar nature of the man's occupation or social status, no advantage is to be gained from such training. The conviction of those who have had the most experience, however, is that in the majority of cases, from every point of view—physical, mental, and sociological, vocational training or reëducation should be begun at the earliest possible moment and while the disabled are still under military discipline.

The creation in the patients of a proper outlook and a spirit of cheerful hope is considered to be one of the most important factors in reëducation; and every endeavour should be made to develop this outlook and inculcate such a spirit from the moment of ad-

mission to hospital. Men who, in daily response to the call of duty, have for months been ceaselessly balanced upon the edge of eternity are, when finally wounded or disabled, inclined to see no escape from a life of dependence upon a pension. Early and organized effort should be made to dispel this illusion; to convince them that by suitable reëducation, even though disabled, they can and must again become self-sustaining, and to persuade them that the duty of the state is not to support them, but to equip them with the means of earning a living wage. In the French hospitals, doctors, nurses and assistants in all branches are specifically instructed to speak cheerfully to patients, to impart hope, and to encourage the prospect of self-support.

In France methods of functional reëducation comprise mechanotherapy; gymnastics; graduated exercises; massage; treatment by galvanic, static, faradaic, and high tension currents; by baking or blasts of hot air; by baths; by vibration; and by coloured light.

The orthopædic centres are equipped with devices for active and passive mechanotherapy. The machines are for the most part actuated by force applied by the patient. Opinion is unanimous in condemning passive mechanotherapy, and in insisting upon the value of active movements initiated by the patient himself. Most of the machines employed are of foreign design, usually Swedish. Some of them, however, have been devised, wholly or in part, by the physicians who employ them. Those invented by Professor Amar are both cheap and efficient, and it is probable that in the future they will be much more widely used.

The exercises first given are simple ones, requiring little mental or muscular effort, such as those often employed in the reëducation of tabetics. To those who have been confined to bed for a long period and who have consequently lost poise and the habit of movement, these exercises are of very great benefit. Leg exercises comprise walking along lines, straight and irregular; stepping over obstacles of varying height and shape; ascending and descending steps with irregular treads. For the arms there are objects of various sizes and forms to be handled, and devices which require the hand to be put in different positions.

Next in value to the performance of voluntary movements is the judicious use of massage and heat. Although at present many of the nurses and assistants, male and female, who administer massage or other treatments in the French hospitals, have little technical knowledge, steps are being taken to give them sufficient instruction to ensure the proper discharge of their duties.

It is strongly urged by many that, apart from its psychic effect, properly selected and graduated work constitutes the best possible means of re-accustoming muscles to action. In many French hospitals workshops have been equipped by private societies. Other allied voluntary societies provide for the distribution and marketing of the salable articles, at a fair but not exorbitant price. Light work for the army, such as the making of bags and flares, and the hemming of towels, is done. In creating a taste for work and maintaining in patients a good frame of mind, these societies accomplish something of very real value. Furthermore, inasmuch as the work done by the patients yields a certain return, it re-awakens and fosters in them a desire to be again producing and earning a living wage. The intervention of war was not necessary to teach even the average observer the danger of unemployment. An important and apposite example is furnished by an analysis of the social progress of a group of injured German workmen who had received a monetary compensation proportionate to their injuries: it was found that the social status of practically all who had not secured work had deteriorated.

It is estimated that about 0.4 per cent. of the wounded will require vocational training. In probably 90 per cent. of these cases the vocational training will be determined by, and will but supplement, knowledge and dexterity in trade or profession already acquired. There will remain, however, a large number of individuals who have never possessed special knowledge or dexterity, and for whom the choice of occupation is of paramount importance. In such cases the individual must be assisted in his choice by those who have had experience in the estimation of abilities and aptitudes, and who have personal knowledge of the patient's inclinations and skill. All workshop training is under the direction of instructors who, apart from their technical knowledge, keep themselves informed as to the requirements of labour in the various industries. As inclination is the temperamental complement of skill, the aim of the instructor should be to train inclinations. Only in this combination does one truly find a vocation. Where training follows inclination, interest is not likely to lag. It speaks for the thoroughness of the French workshop organization that such great stress should be laid upon the selection of the special course of training advised in the individual case. Unless a disabled man has chosen his occupation wisely, and has become master of it, his employment will undoubtedly be most uncertain in the years, not far distant, when,

with the gradual renewal of the economic struggle, sentiments of gratitude and sympathy are bound to disappear.

The supplying of artificial limbs to those who have suffered an amputation is also a serious problem. It is estimated that artificial appliances of some sort will be required by about 1 per cent. of the wounded. It is stated that from $2\frac{1}{2}$ per cent. to 3 per cent. of the Belgian wounded have suffered amputation. The former figure is the French estimate. It is recognized that the state must supply and maintain in repair any artificial appliances necessary for disabled men, and also that such appliances must be made from the best quality of materials and according to the most suitable patterns. Plans and specifications of the appliances adopted by the Commission d'Orthopédie in France have been prepared and issued by that body, and all appliances supplied at the government's expense must be of these patterns. The models adopted are to be revised yearly. In order to secure uniformity these artificial appliances are to be issued at six centres only, and at each of these centres scale patterns of the appliances adopted will be maintained for the use and guidance of manufacturing orthopædists. The model types have been adopted after the most careful study. The diversity of the models permits a considerable latitude of choice to the orthopædic surgeons. In addition to artificial limbs, other appliances, such as skull caps and plates, are being employed for the protection of those who have undergone craniotomy; and springs of various types have been designed to replace muscles, the use of which has been lost.

In the French Army, of those whose limbs have been amputated, about three fifths have lost legs and two fifths arms. While the distribution of disabling injuries of the extremities would point to the reverse of these figures, the final results are due in a measure to the fact that, at the beginning of the war especially, men wounded in the arms were able to find their way to dressing stations, where they received treatment by which their arms were saved, whereas those wounded in the legs not infrequently lay on the ground for a considerable period, and reached the surgeon only when their wounds were infected and amputation was the only treatment possible.

Generally speaking, an amputation stump should have reached its permanent size and be ready for fitting by the time functional reëducation is completed. The first essential for the successful fitting of an artificial limb is the making of a plaster model of the stump. Upon this model the artificial limb is constructed.

In practice the fitting and construction of the artificial limb is undertaken from three to five months after the final operation. A provisional limb may be worn for a time to harden the stump and bring it to its final form. When this is not practicable, a reduction in size of the stump may be effected by massage and bandaging.

While it is easier to fit satisfactorily an artificial arm than a leg, the former can never so completely replace the lost member as as a well-fitted artificial leg.

The consensus of opinion at the present time seems to be that the simplest artificial limb is usually the best, and it is admitted that the aim of an artificial appliance should be to remedy not the anatomical but the physiological loss.

Because the loss of a leg is of less economic importance than the loss of an arm, less attention has been paid to the devising of artificial legs. The peg leg is still held to be the most useful for occupations requiring the exertion of any force. On the other hand, the artificial leg which looks like a real leg may be useful from an aesthetic point of view, to those, such as clerks, whose occupation requires that their appearance should be normal. The disadvantage of the peg leg for those who must walk over soft surfaces, farmers for example, has been partly overcome by the elaboration of a light sandal which can be clamped to the end of the peg. Legs made both of leather and of wood have been adopted by the French Commission.

While admitting that an artificial arm can never be much more than a support, Professor Amar expects that his arm, especially the steel forearm and claw, will give useful service, the latter in even the heaviest occupations. He states that he knows over one hundred armless men who are working successfully for ten hours a day and earning good wages in manual occupations. There are others, however, who insist that maimed men will usually get real service most easily from some simple device of their own or from the apt use of their stump. This opinion holds good for those who have lost legs as well as for those who have lost arms, and there appears to be some sound foundation for it. The frequency with which men use the stump of an amputated arm or leg for various operations, and discard their artificial appliance while at work, is remarkable. Innumerable instances might be cited of the ingenuity which quickly devises appliances for making easy operations which a mutilation has made difficult.

The unwillingness shown by disabled men earlier in the war to undergo a course of vocational training threatened to nullify the

efforts of the French Government in their behalf. There seemed to be some apprehension that, if a disabled soldier increased his earning power through reëducation, the government would grant him a smaller pension. Furthermore, the benefits to be derived from reëducation were not thoroughly appreciated. To remedy this situation, the government issued the definite assurance that a man's pension should depend upon the extent of the incapacity resulting from his injury and not upon his earning power, and that they would assume not only the cost of instruction but also the cost of maintenance during the period of training. The sympathy and active coöperation of the public were secured by means of advertisement, speeches, lectures, and cinematographic films, setting forth the advantages, personal and economic, of a training which would fit the disabled to maintain his place in the social and industrial life to which he was returning. These measures have resulted in a steady increase in the percentage of wounded applying for reëducation.

In Canada the government has issued the assurance that a man's pension shall not be reduced because of his having increased his earning power through his own industry.

In conclusion let me reiterate the conviction of those who have had the most experience: that no disabled soldier should be permitted to return to his home without having first undergone a course of reëducation or vocational training.

SPHAGNUM MOSS FOR USE AS A SURGICAL DRESSING; ITS COLLECTION, PREPARATION AND OTHER DETAILS

AN ILLUSTRATED DEMONSTRATION

BY PROFESSOR J. B. PORTER

McGill University

THE September number of the well-known and justly popular London *Graphic* bore in conspicuous capitals on its front cover the question—"Are you collecting Sphagnum Moss?—see page 281," and thus brought before its large circle of Canadian readers what was to most of them a new word and a novel war activity.

Scholars of Greek of course knew what Sphagnum used to mean, and botanists recognized the word as the generic name of the peat mosses, but even these learned people were probably surprised and somewhat incredulous when they read that "the collecting, drying and making into surgical dressings of sphagnum moss has become a national industry in Scotland"—that "the work is being extended all over Ireland, England and Wales," and that the Government through Sir Edward Ward, D.G.V.O., had established central depots all over Great Britain to receive and forward the material to the war hospitals which were "profoundly thankful for a dressing which is better than absorbent cotton."

Although I have introduced my subject by this quotation from the *Graphic* I do not labour under the delusion that that excellent paper is a standard work on Surgery, neither do I lack more weighty authority; I quote it simply because no previous publication had stated the case in so striking a way or to so large an audience. As a matter of fact sphagnum dressings made their appearance in the British press at least two years ago and since then have been much written about, but here in Canada at least, very few people seem to have heard of them and the majority of our medical men have been too intent on other matters to pay much attention to the

Read before the Montreal Medico-Chirurgical Society, November, 1916.
Received for publication January 23rd, 1917.

occasional sphagnum articles in the *British Medical Journal*, *The Lancet* and other similar publications.

In spite of our incredulity or indifference the *Graphic* statement is apparently within the truth, and what is more to the point, not only are voluntary aid workers by the thousand collecting, and preparing, sphagnum, but after due experiment the War Office has formally approved of the dressings; the Red Cross has followed suit, and last, but not least so far as we are concerned, the Canadian Red Cross Commissioner in London has requisitioned a monthly supply of some thousands of dressings of Canadian sphagnum for the Canadian hospitals in the Shorncliffe and London areas.

Sphagnum is the basic plant of the peat deposits which for many years I have been studying in connexion with a research for the Canadian Government on the fuel resources of Canada. Thus when certain of my friends, including the late Sir Lauder Brunton, wrote last winter of the attempt that was being made to introduce sphagnum for surgical dressing purposes, it occurred to me that here was a chance for one who was too old to fight still to be of some use, and therefore I obtained through my correspondents specimens of "surgical" moss, and after learning all I could about the matter I set to work to search the different bogs in this country for suitable material. Even in the spring of 1916 the use of moss in the hospitals was still in the experimental stage and I had great difficulty in getting my specimens passed upon by the authorities. Ultimately, however, they reported on the samples, accepting some lots and rejecting others, and thus I found that in certain parts of Canada we had excellent surgical sphagnum. I then collected a few hundred bushels of the best moss available and persuaded the local Red Cross organization in Guysborough—the town nearest my country home in Nova Scotia, to prepare a large number of dressings to War Office specification, and a lot of these dressings was sent over to be tested in actual service.*

The work above outlined was of course private and altogether unofficial, but after proceeding thus far we turned the matter over to the Quebec Provincial Red Cross and they, with the help of certain affiliated organizations, are now making the dressings and arranging to send forward a regular monthly supply to the Canadian hospitals in England.

*At the time of Dr. Porter's address no report had been received regarding this sample lot of dressings, but since then formal notification has been received that "they are of exceptionally good quality and of very high absorbency."

Sphagnum is the Greek word for moss, but at present is restricted by botanists to a single genus of about forty species and varieties all of which are found in sub-Arctic and cold temperate zones. They are at their best in Newfoundland, Labrador and other northern districts, but they also grow freely in central and eastern Canada and other similar districts on the European continent. The decayed or semi-decayed sphagnum accumulated in the bottom of bogs is the fundamental material of peat, and the living plants themselves are largely used in Europe, and particularly in Germany, for cattle bedding, packing material, and various industrial purposes.

The softer and finer qualities of sphagnum have been used since time immemorial in what might be called home-made surgery, and moss dressings are said to have been employed to a limited extent in the Napoleonic and Franco-Prussian wars; but since then little has been heard of them until after the present war began. We now know, however, that the German army medical people were using them before the war and that they are using them in large quantities at the present time.

The British use of sphagnum in army surgical work proper has, I believe, developed altogether within the last eighteen months. Dressings made by Cathcart in Edinburgh were apparently the first to be used, but I have no exact information as to dates and quantities. Dressings were apparently first furnished to the War Office last autumn, but even up to the middle of April of this year the supplies were relatively small. The Irish St. John's Ambulance Association, under the presidency of the Countess of Waterford, followed the Edinburgh society closely and created a sphagnum department in October or November, but this organization was only producing 5,000 dressings in April, whereas now it is supplying about 35,000 per month. Similar societies have grown up in England and Wales, and the total output of dressings had reached a very large figure even before the War Office and the Red Cross formally adopted them in the latter part of the summer. To show how rapidly the demand has grown I might refer to an article by Sir Alexander Ogston in the *National Review* for August. He estimates the probable number of casualties for the coming year, discusses the vast quantity of surgical supplies which will be required by the several belligerent nations, and concludes that within the next twelve months at least fifty million dressings should be prepared for the use of the various war hospitals. He makes it clear that he considers sphagnum superior to any other available absorbent dressing.

Whether his huge estimate is right or wrong it is clear that the demand will be so enormous that Canada with its large sphagnum resources, and its supply of willing Red Cross workers, should lose no time in getting to work.

Only two or three of our numerous species of sphagnum have proved suitable for surgical use, and of these one—*S. papillosum*, found thus far only in the Maritime Provinces, is far superior to all others. Some specimens of this plant show an astonishing absorbency and dressings made of the best dry moss will absorb twenty to twenty-two times their own weight in water before they begin to drip. Average moss will go as high as twelve at least, whereas absorbent cotton does not go above half even of this last figure. Another advantage of sphagnum is that it holds the absorbed liquid far better than cotton and does not get foul nearly so quickly, these valuable qualities being no doubt due to the fact that in sphagnum the liquid is taken into large cells with elastic walls instead of being merely held by capillarity between the fibres as in cotton. These exceptional absorbent powers are as true of pus and other liquid discharges as of water, and hospitals using moss find that their dressings do not require renewal nearly as frequently as ordinary gauze and cotton. Further the moss dressings are much lighter and less heating, and a great many observers call attention to these features as conducing greatly to the comfort of patients.

"I feel assured that sphagnum is the dressing for the Carrel Tube system. It is so light and absorbent."

Extract from a letter from Colonel Caird, Professor of Clinical Surgery in Edinburgh, now on duty in France.

"Sphagnum dressings require only a thin layer of gauze over the wound, or not even that if gauze is scarce, as the gauze bag which contains the moss is practically sufficient. For all freely discharging wounds sphagnum dressings are much superior to cotton; for wounds with slight discharges either would serve the purpose."

Extract from a letter from the chief surgeon of a large British war hospital.

"Even the best prepared cotton, although in a sense very absorbent, lacks the power to retain discharges which is possessed by sphagnum moss. Thus whereas a pad of absorbent cotton allows these sanious discharges to penetrate and pass beyond to the bed clothes through a very limited portion of the dressing, or causes them, when thick, and purulent, to lie between its clogged surface and the wound, a pad of sphagnum absorbs and holds up the discharges until it becomes fully saturated.

"In civil hospitals in times of peace the deficiencies of cotton are not so much noticed. The majority of the wounds are those made by the surgeons themselves under ideal conditions and thanks to antiseptic surgery these wounds have only a slight discharge if any at all. Hence the fallacy of supposing that a dressing which meets requirements in a time of peace must be equally useful under all circumstances, including those of war."

Extract from a paper by C. W. Cathcart, senior surgeon Edinburgh Infirmary, June 16th, 1916.

The writer has been informed recently by one of the nurses at the Eastbourne Naval Hospital that sphagnum dressings were found very satisfactory, and were greatly preferred by the patients as they were less heating than cotton and therefore far more comfortable. They were also found particularly useful in cases of bad burns. The same informant said that splint pads made of second quality sphagnum were greatly preferred to cotton for fractures, as they retained their elasticity and were cool and very light.

Owing to the great variations in usefulness of different kinds of sphagnum, the material has to be collected by people who have been trained to know the good from the bad, and as the different species of sphagnum grow very much intermixed the collector will often have difficulty at first in deciding just what to take and what to leave. The method of collection is to wade out into the bog, grasp and pull up the upper layers of the moss by the handful, wring them out, put them in sacks and take them to the edge of the bog whence they are carted to some suitable place where they can be spread out to dry and have the rubbish picked out. The rough dried moss is then shipped to Red Cross work rooms where it is very carefully picked over and classified into three or more qualities. All the best stuff is put into muslin cases for dressings, the intermediate is made up into pillows, splint pads, dysentery pads, etc., the worst discarded. One has to be extremely careful about the first collecting, as the picking over of poor moss requires an enormous amount of labour and time, and produces very little material in the end. Throughout the work all possible precautions are taken to keep the moss clean and free from infection, but the general opinion seems to be not to attempt to sterilize the dressings here, but to leave that business to the hospitals. In the earlier months of the work Dr. Cathcart sterilized a considerable number of his dressings, about a fifth of his material, and the Irish Bureau about a tenth, the rest going forward unsterilized. Now I am informed that all of the British hospitals at least do their own sterilizing which is far more satisfactory.

In closing I may say that although this surgical use of sphagnum is extremely new, except in Germany, and is still to a certain extent experimental, yet already there are thousands of volunteer workers engaged on the preparation of dressings in Great Britain, and the two or three score of Canadians now interested can easily be multiplied by a hundred, if necessary, in the spring. There is no doubt that the material is greatly needed, and it is popularly understood that the supplies in Great Britain are insufficient to meet the

demand. Official information as to this latter point is, however, being sought, and if the reply is such as we anticipate it is hoped that Canadians, particularly in the Maritime Provinces, will interest themselves heartily in the work.

The literature of sphagnum is far from voluminous if we except the popular, but irresponsible, statements which have appeared in the Scotch and English newspapers during the last year. Certain of the technical articles are, however, definite and satisfactory.

1. The first mention of sphagnum in connexion with modern surgery seems to have been in 1882 when Neuber and others published a series of articles in German beginning with an important paper in *Arch. für Klin. Chir.* Bd. 27, S. 757. These articles interested a number of British surgeons, but so far as I can learn were not re-published or even abstracted in English until after the war began when Professors Balfour and Cathcart published a translation with comments and recommendations:

2. "Bog Moss for Surgical Dressings," *The Scotsman*, November 17th, 1914.

3. The Neuber article was again reviewed in an excellent paper by Cathcart: "Cheap Absorbent Dressings for the Wounded," *British Medical Journal*, July 24th, 1915, pp. 137-8-9.

4. The question of the sterilization of sphagnum dressings is taken up by Cathcart in "Methods of Preparing Sphagnum Moss as a Surgical Dressing," *The Lancet*, April 15th, 1916, p. 820.

5. The general sphagnum situation is discussed at length in an important article by Sir Alexander Ogston: "Our Wounded—Sphagnum Moss as a Dressing," *National Review*, August, 1916.

There are numerous other references to the subject in the medical press, but so far as I know none of them are of any considerable technical importance. The following may, however, be mentioned:

6. *The Lancet*, October 16th, 1915, p. 898.

7. *The Lancet*, December 11th, 1915, p. 1316.

8. *British Medical Journal*, December 25th, 1915, p. 942.

9. *The Scotsman*, June 16th, 1916.

10. *British Medical Journal*, August 12th, 1916.

SUPPLEMENTARY NOTE BY THE AUTHOR

Since the above address was given the situation has developed considerably. Favourable reports on sphagnum dressings have been made by the commanding officers of several Canadian war

hospitals, and definite requisitions for very large quantities of dressings have been received from the Director of Medical Services Canadian, in England, and from No. 3 Hospital in Boulogne, etc. On the other hand we are officially informed that the facilities for producing dressings in Great Britain and Ireland have so increased that Canadian supplies are not immediately required, although they probably will be greatly needed when the spring campaign begins. Finally the present submarine situation is such that there is some question as to whether it will be advisable further to burden our already overtaxed shipping with relatively bulky consignments of dressings.

The central executive of the Canadian Red Cross is dealing with the situation in a very practical way. A special Sphagnum Committee has been appointed to look into the whole matter. Standard specifications for collecting and preparing moss are being drawn up, an inspection department is being organized and the Provincial Red Cross Societies in Eastern Canada and particularly in Nova Scotia are much interested and will undoubtedly take full charge of the work of making dressings. By the time the snow melts and our bogs again become accessible, arrangements will have been completed for the production of whatever quantity of dressings may be required, and in this connexion it must be realized that even if transportation difficulties render it inadvisable to send large supplies overseas, the work now being done will not be wasted, as sphagnum dressings have proved to be so useful and so much cheaper than gauze and cotton that a considerable demand will unquestionably grow up in our own hospitals.

In conclusion it should be stated that while the Canadian Red Cross is thus undertaking serious and probably extensive work on this new material, it considers it very inadvisable for untrained persons to make up dressings. Experience in Great Britain has shewn that only certain grades of moss are useful and dressings made to any but the strictest specifications are likely to be worse than useless. It is desirable that all accessible bogs in Canada should be searched for suitable moss, and specimens sent to the Secretary of the Sphagnum Committee at McGill University will be examined and reported on without delay, but no attempt should be made to collect moss in quantity, still less to make dressings, except with the approval and subject to the inspection of the Provincial Red Cross authorities.

END RESULTS OF THE VARIOUS DISABILITIES OF THE RETURNED SOLDIER

BY CAPTAIN E. HOBART REED

*Medical Officer Ogden Military Convalescent Hospital,
Calgary, Alberta*

IN dealing with this subject we may place such disabilities into two general groups, i.e.: 1. MEDICAL, and 2. SURGICAL; and as a subdivision of the first, the *Mental*.

In the first group the profession has been called upon to deal with a condition of which before the advent of the "Kultur of William" we have had a very meagre and superficial experience. I refer to those men who have been "gassed" and more especially to those who in the early days of the war fell victims to the chlorine gas. I perhaps should not say it was definitely chlorine, but in any event the physical properties of this noxious vapour very closely resembled those of chlorine. As to the acute stage of the poisoning, I can only give you the experience of some of those who survived. The prognosis depended very definitely upon the amount of gas inhaled, and on its composition. The period of suffocation and prostration are practically synonymous, in some cases the gas is taken into the stomach as well as the lungs and necrosis of the mucous membrane with the attendant lack of secretion in the severe types, and the hypersecretion in the milder cases soon follows. The treatment is chiefly symptomatic and supporting and the patients are sent to the convalescent homes as soon as their condition will permit. It is here that the opportunity for observing the after-effects is available. More or less discussion has been raised from time to time as to the proper locality for these patients to put in their period of convalescence. My personal opinion last January was that these men would do better at sea-level; several men were transferred to the Naval Hospital at Esquimalt, British Columbia. Some of these seemed to do well while others were not benefitted by the change. The most marked improvement occurred in those

Read at the meeting of the Alberta Medical Association, September 21st, 1916.
Received for publication October 20th, 1916.

cases where "Shock" was a prominent feature. When these men first arrived at Ogden it was noted that practically all were suffering from aphasia to some degree, and as one man expressed it, "I can only get out a word now and then but I have the answer ready as soon as you finish the question." Cyanosis and dyspnoea were always present when under excitement and exhaustion followed the slightest exertion; clinically very little could be made out; there are always numerous rhonchi present with no impairment of resonance. Skiographic examinations revealed only slightly thickened pleura and prominent bronchial glands most noticeable in the mediastinum. One sequela of this condition noticeable by its absence is tuberculosis; in none of these cases have I been able to find any sign of this infection. These patients, as their condition improves, increase in weight, but their strength does not begin to return in the same ratio. Outside the shortness of breath on slight exertion the neurotic phase seems the most persistent. Some of the men have been under observation for over nine months and while improvement has taken place I know of none up to the present time who are fit to be taken on again for overseas service. The periods of dyspnoea and cyanosis have lessened and a slow general change for the better is evident in all, but it is impossible to say at this time what the final degree of recovery will be. A great deal of work will be done and is being done, but I think the best results have been obtained by the general use of respirators and masks, which emphasizes the old saying that "an ounce of prevention is worth a pound of cure".

With reference to pulmonary tuberculosis, very few men were returned during the early part of the war suffering from the disease. During the last eight weeks this form of disease has constituted nearly 50 per cent. of disabling conditions which have been sent into Military District No. 13. There may be two ways of accounting for this; in the first instance it is very probable that many men when enlisted may have been suffering from this malady in the incipient form. Far be it from me to cast any reflection upon the medical officer who may have passed these men as fit, for the physical examination of the recruits, while it is as thorough as possible to make in the time at one's disposal, obviously does not include an examination of either the urine or sputum. Even were either of these accessible, it is a very easy matter to overlook these items when the physical signs do not arouse suspicion. Again, the large majority of men while in training and under canvass show a marked improvement in their general health, and it is not until they are at the front and have been through one or two winter cam-

paigms in the trenches that their powers of resistance are taxed to the utmost and the trouble makes itself manifest. Pneumonia and pleurisy are easily contracted, and with the lowered resistance brought on by privation and exposure we may look for a large number of these cases before the end of the war.

In dealing with the *Mental* condition we may again divide this subdivision into two classes; there are those that are classified as "shell shocked" and this term covers a very wide field; then again there are the insane. I am of the opinion that many of the insane would have stopped at the stage of "shell shock" were it not for the determination of the men to "carry on" until they fall victims of complete nerve-exhaustion or actually reach the stage of insanity. In the "shell shock" cases loss of memory is a prominent feature which, however, shows satisfactory improvement under favourable conditions. The same may be said of the insane, only in this instance the period of convalescence is longer; such recoveries as have occurred in these shock cases are recent, but it is very doubtful if any of the patients in the two classes just mentioned would be considered fit to be taken on again for overseas service.

The *Rheumatic* conditions generally make their presence known after a few weeks in the training camps, in this instance I refer to both types, feigned and real. The percentage of returned men thus far suffering from rheumatism has been comparatively small.

The *Surgical* conditions constitute the major portion of the disabilities of the returned soldiers. The character of these wounds has been changed from time to time, as is noted for example by comparing the number of shrapnel and gunshot wounds of the skull six months ago, and at present. This again is in all probability due to the wearing of metal helmets by the men in the first lines of trenches. These cases do well, and it is to the credit of those who first handle these men in the dressing stations and clearing hospitals that the primary infection is not fatal. Too much praise cannot be given to them when one stops to consider the many difficulties under which they are carrying on their work. Practically all the wounds are healed when the man arrives in Canada and practically all are infected when they fall into the hands of the medical officer in the field.

¶ The explosive and reversed bullet were very popular with the German until he began to receive them.

It is the wounds of the face and extremities that offer the largest fields for reconstructive surgery. I shall not attempt to enumerate the many original and skilful bits of repair work that have been

done especially by the French, but will deal chiefly with the deformities as they exist and the means that are being used to combat them. This brings us to the system of Remedial Exercises which is being carried out in all the hospitals, both in Europe and in Canada. One of the most useful pieces of apparatus is what is known as the *wall rack* which consists of a wooden frame divided into three sections firmly bolted to the wall, which will accommodate three men; the men are placed in this frame where contracted and atrophied muscles can be stretched and developed. The exercises can be made as light or as strenuous as the case requires. Not a few men have been returned to active service, while others have been taken into what is known as the special service battalion, where they can do clerical or other light work thereby releasing men who are fit to go to the front. The results as a whole have been encouraging and much more may be looked for from this system in the future. About six months ago it was known that Germany was returning from 85 to 92 per cent. of her wounded to service, while the English and Canadians were returning from 15 to 18 per cent. This led to the adoption of a gradual system of physical training of the returned men, whereby a large number of what were before useless men from the physical standpoint are now able to "carry on". From the present indications it would appear that outside of the men who are minus an arm or leg, the largest percentage of casualties who will be able to reënlist will be those who have suffered from surgical conditions as compared to the gassed patients.

In the treatment of wounds medical gymnastics is very useful:

1. In preventing the formation of the scar interfering with the function of the limb, as well as in avoiding the stiffness in the joints of the wounded member.

2. In maintaining the muscular system of the region.

3. In preventing the fixation of a nerve in the scar. In case this has been freed by surgical intervention it is necessary that medical gymnastics be applied with the shortest possible delay.

Motor reëducation, that is to say the reëducation of the muscles and of the segments to their normal action, medical gymnastics adopts itself perfectly to the needs and to the capacity of the individual. Day by day it can be modified and adapted to all phases of reëducation. The moral and physical influences springing from the suggestion created by the movement are themselves a great influence in these cases. Medical gymnastics can in effect frequently restore to the patient confidence in himself and his forces.

We now come to the subject of *Vocational Training* and we at

once realize that the future of the wounded depends upon the direction of the activities of the man towards some particular trade. Too great care cannot be taken in this regard and one cannot be guided alone by the man's previous experience, but by his physical and mental capacities. His general psychic condition will determine the diminution of his former personal value which is the result, often unsuspected, of the wound. Very exact information of this initial condition of the invalided soldier, and his probable degree of improvement, is due alike to him and his employer.

As a general rule it will be the purpose of the Vocational Department of the Military Hospitals Commission to extend the man's knowledge of his trade to a higher state of preparation, adding to his practical knowledge enough of the theoretical to make him more valuable in his particular line of endeavour; others again must be taught a trade where before they were unskilled labourers.

The problem confronting the Survey Board who pass upon the condition for reëducation is a heavy one and the responsibility is great, for not only do they find it difficult to persuade the prospective student to take up the line of work they find him best fitted to perform, but too often we are confronted with the inclination of the man to cast aside all opportunities for reëducation to accept some "job" with no assurance of its being permanent when all it has to recommend it is the fact it "pays good money".

Our problem of mobilization has been a large one in this great and devastating war—and it is not yet finished—and yet before the end is even in sight we are confronted with even a greater one, that of demobilization. The vastness of the latter is only just beginning to dawn upon us, but when we realize as did Dr. Mewburn when he said in one of his letters: "We will win this war—but our sorrows will be great and most of our male population will be cripples," we begin to see that the time when we can again feel that we are once more back where we were prior to August, 1914, lies far in the future.

THE TREATMENT OF SYPHILIS

ITS EFFECT UPON THE WASSERMANN TEST USING HIGH DILUTIONS
OF SERUM. A PRELIMINARY NOTE

H. K. DETWEILER, M.B.

Research Fellow in Bacteriology and Serology, University of Toronto

THERE has appeared during the past few years a great mass of literature dealing with the treatment of syphilis, and its effect upon the Wassermann reaction. Generally speaking, it is now conceded that the progress of the treatment is gauged most accurately by the complement fixation test, and a cure is not claimed until the test has been consistently negative for some time, without treatment. So far as those points are concerned, the question may almost be considered a closed one, and yet I propose to read this paper without making any apology for seemingly treading such a well-beaten path. My reasons for bringing this subject to your attention to-night are mainly three: First, the alarming prevalence of the disease; secondly, the necessity of keeping well before us what is already known concerning the treatment; thirdly, the fact that many physicians become very pessimistic regarding treatment after receiving several reports from the laboratory indicating no change in the Wassermann reaction after prolonged treatment.

With regard to the first point, let me briefly call to your attention a few figures to substantiate my statement. Twelve per cent. of all patients coming into the Toronto General Hospital, from any cause whatsoever, have syphilis! In our Outdoor Department the figures are considerably larger, but unfortunately it is not possible to get a routine Wassermann there. We took 779 Wassermann tests in the Outdoor in the year December 13th, 1915, to December 13th, 1916, and of this number 327, or 42 per cent., were positive. When you consider that those figures are taken from the first year of the existence of our Syphilis Clinic, or "Special Treatment Clinic", as we call it, and when you realize that the people

Read before the Peterborough Medical Society, January 11th, 1917.

Received for publication, January 18th, 1917.

are just beginning to find their way to this clinic in large numbers, you can form some estimate of the prevalence of syphilis in Toronto. And the majority of these cases are not suspected! That has been our experience, and it is the experience of investigators in Boston.* The latter do not give definite figures covering all types of cases, but we have found that 66 per cent. of all our cases of syphilis in the wards of the hospital were not suspected of having this disease.

With regard to the third point, the following remarks will make clear our object. Many cases of syphilis respond readily to treatment, the symptoms clear up, the Wassermann test becomes negative, and the patient probably is cured. There are a great number, however, which do not show any change in the Wassermann reaction, or do so only after a very long and vigorous course of treatment. For some time past I have felt that we should know what is going on in these cases during this period of treatment. It seemed to me that were we to make a more delicate test of their serums we might detect a change, even in these apparently intractable cases. In examining the literature we found no report of such work having been done. Craig† made dilutions of serum down to 0.02 c.c., in untreated cases, every day for a week, and found that the strength of the reaction varied slightly from day to day, but in the main his results showed that with repeated Wassermann tests, the variations are negligible save in cases which apparently did not have a very strongly positive test at any time. Such instances in untreated syphilis are, in our experience, very rare. It is quite probable that his variations were largely due to differences in the antigen, or as suggested by Haller‡ to variations in the hæmolytic system. The latter author's findings are remarkably constant. Recently King¶ reported results of the quantitative test after treating with salvarsan. In this communication he concludes that little change occurs in the strength of the Wassermann reaction during the first five days following the administration. He also makes the rather general statement that "some previously untreated cases

* WALKER, J. C., and HALLER, D. A. "Routine Wassermann Examination of Four Thousand Hospital Patients". *Jour. Am. Med. Assoc.*, Feb. 12th, 1916.

STOLL, H. F. "The Syphilis We See but Do Not Recognize," *Boston Med. and Surg. Jour.*, 1915, clxxiii, 608.

† CRAIG, C. F. "Variations in the Strength of the Wassermann Reaction in Untreated Syphilis," *Jour. Amer. Med. Assoc.*, April, 1914.

‡ HALLER, D. A. "Variations in the Strength of Positive Wassermann Reactions in Cases of Untreated Syphilis," *Jour. Amer. Med. Assoc.*, March 18th, 1916.

¶ KING, JNO. I., JR. "The Quantitative Effect of Salvarsan on the Wassermann Reaction of the Blood." *Jour. Amer. Med. Assoc.*, December 2nd, 1916.

may be given prolonged salvarsan therapy with very little weakening of the Wassermann reaction", though he adds, that they may show striking improvement clinically. We shall take occasion to discuss these statements after presenting our experiments and exhibiting our charts.

TECHNIQUE. In our laboratory, we use a cholesterinized heart antigen and an anti-sheep hæmolytic system. Ordinarily we make three dilutions of the patient's serum—0.2 c.c., 0.1 c.c. and 0.05 c.c. This gives sufficient information for the regular routine test. Many laboratories use only one dilution—0.1 c.c. For the purposes of this investigation we chose new cases, i.e., cases that had never before been treated for syphilis, and we took them in order as they came to the Out-Patient Department. The number is small, considering the size of our Clinic, and the fact that they extend over a period of three months, but many factors come in to disturb an otherwise ideal field. For example, many cases have previously received desultory treatment in time past. Many leave town before the investigation is completed. Others find their clinical symptoms clear up, and then, despite the warning of the physician that the disease is not yet eradicated and the visits of the social service workers in an endeavour to keep them interested in their own cases, fail to return. The Wassermann test is done before any treatment is begun, and then, with few exceptions, every time the patient returns for treatment (every week if circumstances permit) a sample is taken just before the treatment is administered. The same antigen is used throughout the series. The serum in all cases is diluted so that the small amounts to be used may be accurately measured. Seven tubes, besides the serum control, are used for each case, and they contain 0.2 c.c., 0.1 c.c., 0.05 c.c., 0.025 c.c., 0.01 c.c., 0.005 c.c. and 0.0025 c.c. of the patient's serum. The control tube contains 0.4 c.c.

It may be well, at this point, to describe briefly our method of recording results, as it differs from any we have yet seen. The result in each tube in the test is represented by a number. The figure 4 means that no hæmolysis has occurred in that particular tube; 2 means 50 per cent. hæmolysis; 1 would be 75 per cent. hæmolysis, and 0 would be complete hæmolysis. For example, in our routine Wassermann tests, 444 means no hæmolysis with 0.2 c.c., 0.1 c.c., or 0.05 c.c. serum. Naturally, when a case begins to show the effect of treatment, it is the third tube which goes first since it has the smallest quantity of serum. In this investigation there are seven figures, which indicate exactly what the technician sees in

each tube, so that by this method the reader can gain almost as vivid a picture of the result of a test as the one who performs it.

RESULTS. At this early date, our results are necessarily far from complete, but sufficient information is at hand to prove of interest and profit to the man who treats this disease. There are thirty cases in the series. Of these three are congenital; six are in the primary stage, eight in the secondary stage, eleven tertiary* and two were latent. Of the thirty cases, ten have become negative. Of these, two were congenital, three primary, two secondary, two tertiary, while one was a case of latent syphilis. The average amount of treatment required to produce these negative Wassermanns was 4.5 doses averaging 0.5 grams of diarsenol. Of the remainder, seventeen have definitely improved from a serological standpoint, leaving three cases unimproved. One of these cases is tertiary, one G.P.I., and the other latent, and two of these have only had two doses of diarsenol. Other experiments are in progress with other forms of treatment, as mercury, etc.

It is impossible to compare our results with those of other investigators because of the lack of parallel experiments. King probably comes the nearest to our field of work, but he observed his cases over a very short period of time,—five days. He concludes that very little change occurs in the strength of the Wassermann test as the result of a dose of salvarsan. In looking over his protocols we find that three cases out of twenty show a definite weakening in the test, and while our series show a larger percentage than this, we agree to a certain extent with his contention that it takes more than one dose to produce a marked effect upon the complement fixing substances. It was a serious mistake at the beginning of salvarsan therapy, to assert that one dose, or at most two, would be sufficient to cure. It is not surprising to find the laity reluctant to discard this hope, in view of the fact that the symptoms and lesions often clear up very rapidly, but that many of the profession should also be slow to acknowledge its fallacy is indeed a matter for concern, for it is surprising how many still treat syphilis without calling in the aid of the laboratory to check up the progress of the case.

Among the cases which do not respond to treatment general paresis seems to be practically intractable. Such a case is illustrated

Owing to the lack of a clear line of demarcation between the different stages of syphilis, the above classification is necessarily arbitrary and only approximate. Primary means the presence of a chancre, secondary, the presence of rashy sore throat, mucous patches, condylomata, etc. Tertiary indicates the presence of gummata, vascular changes, etc.

in table H. H., although treatment will be much more prolonged before the experiment is considered complete. For the other types of cases, this short series seems to furnish a definitely favourable result.

The charts are shown with the view of impressing upon our minds the optimistic outlook in treating syphilis. What we wish specially to bring out is the fact that in nearly every case, long before the ordinary Wassermann test shows any sign of being affected by the treatment, the more delicate titration of the serum herein described gives unquestionable evidence of benefit. This is well shown in even this small series and when this research is completed, we hope to have conclusive proof that even in so-called refractory cases, serological changes in the blood will show improvement in at least the higher dilutions. We would therefore make an earnest plea for persistence and optimism in obstinate cases, feeling sure that in nearly every case improvement, sufficiently definite to be reliably measured in the laboratory, will be the outcome.

CONCLUSIONS

1. The serological improvement in the blood of cases of syphilis is often not indicated in the ordinary Wassermann test.
2. By titrating the serums as described under "Technique", such cases, in practically every instance, can be shown to have definitely improved, often after only one injection
3. These findings constitute a strong justification for persistence in treatment of so-called "refractory" cases.

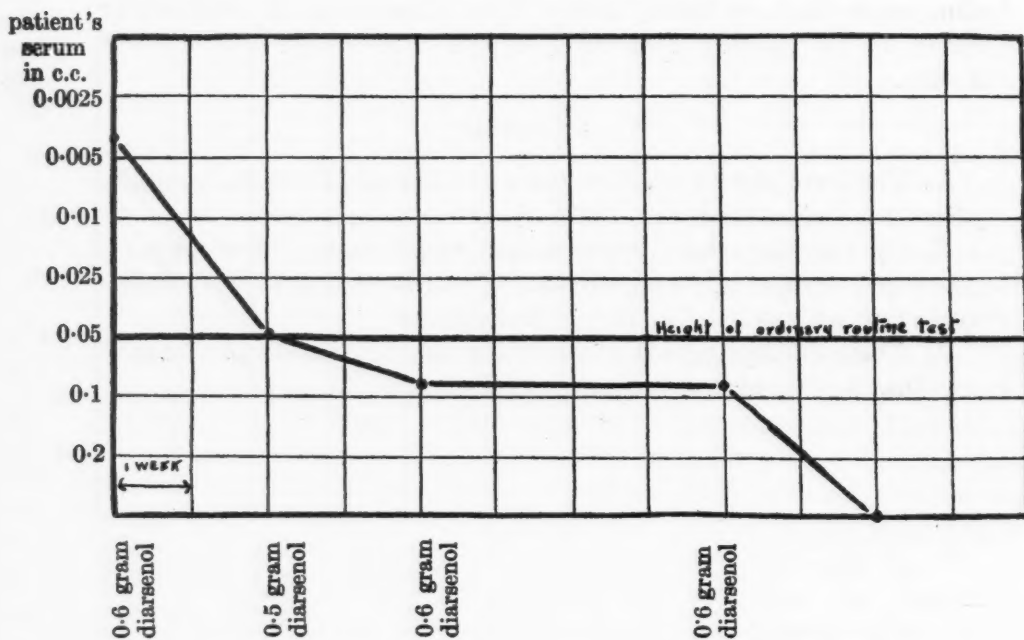
CASE A. M.—7185.

*TABLE I.—SECONDARY.

		Wassermann test						
Nov. 23	No treatment	4	4	4	4	4	1	0
Nov. 30	.3 gr. diarsenol	4	4	4	4	0	0	0
Dec. 7	2-.3 gr. diarsenol	4	4	4	2	0	0	0
Dec. 14	3-.3 gr. diarsenol	4	4	0	0	0	0	0
Jan. 4	. . . . .	0	0	0	0	0	0	0

CASE M. K.—6829

TABLE II.—SECONDARY

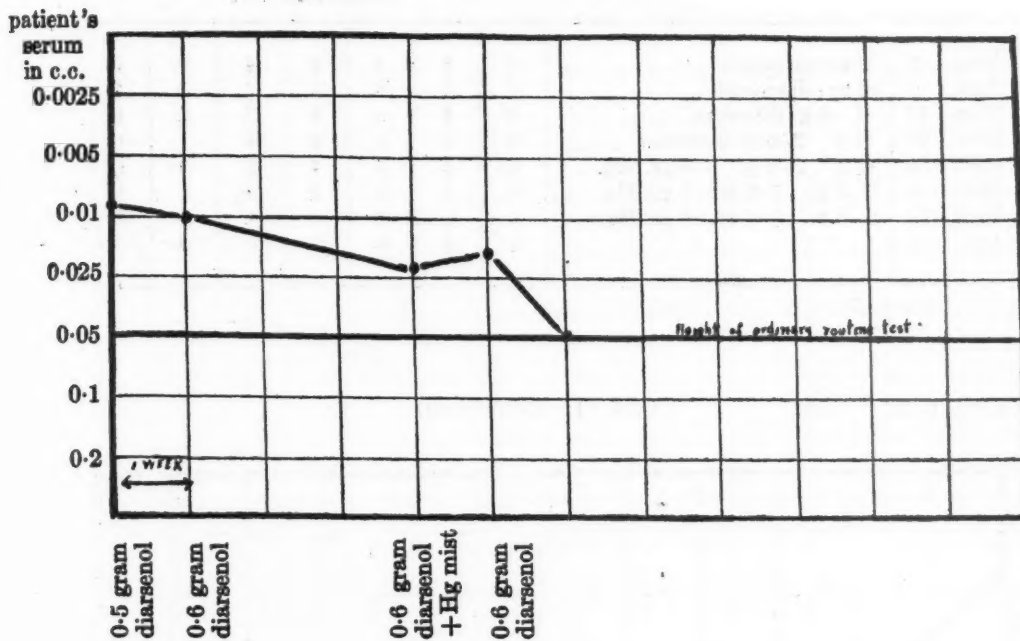


		Wassermann test						
Oct. 5	No treatment	4	4	4	4	4	2	1
Oct. 16	.6 diarsenol	4	4	4	0	0	0	0
Oct. 27	1-.6 gr. + .5 gr. diarsenol . . .	1	1	1	0	0	0	0
Nov. 30	2-.6 gr. + .5 gr. diarsenol . . .	1	1	1	0	0	0	0
Dec. 13	3-.6 gr. + .5 gr. diarsenol . . .	0	0	0	0	0	0	0

*Tables indicate total treatment up to date mentioned in each case.

CASE E. G.—7238

TABLE III.—TERTIARY



Wassermann test

Nov. 10	No treatment.....	4	4	4	4	4	1	0
Nov. 18	.5 gr. diarsenol.....	4	4	4	4	3	1	0
Dec. 5	.5 gr. + .6 gr. diarsenol.....	4	4	4	3	1	0	0
Dec. 11	.5 gr. + 2.6 gr. diarsenol (Mercury mist.)	4	4	4	4	2	0	0
Dec. 20	.5 gr. + 3.6 gr. diarsenol (Mercury mist.)	4	4	4	0	0	0	0

CASE E. B.—6796

TABLE IV.—TERTIARY.

Wassermann test

Sep. 28	No treatment.....	4	4	4	4	3	2	1
Oct. 7	1 diarsenol .3 g.....	4	4	4	4	2	1	0
Oct. 13	1 dose .3 g. 1 dose .6 g.....	4	4	4	2	1	0	0
Oct. 25	1 dose .3 g. 2 doses .6 g.....	0	0	0	0	0	0	0
Nov. 29	.....	0	0	0	0	0	0	0

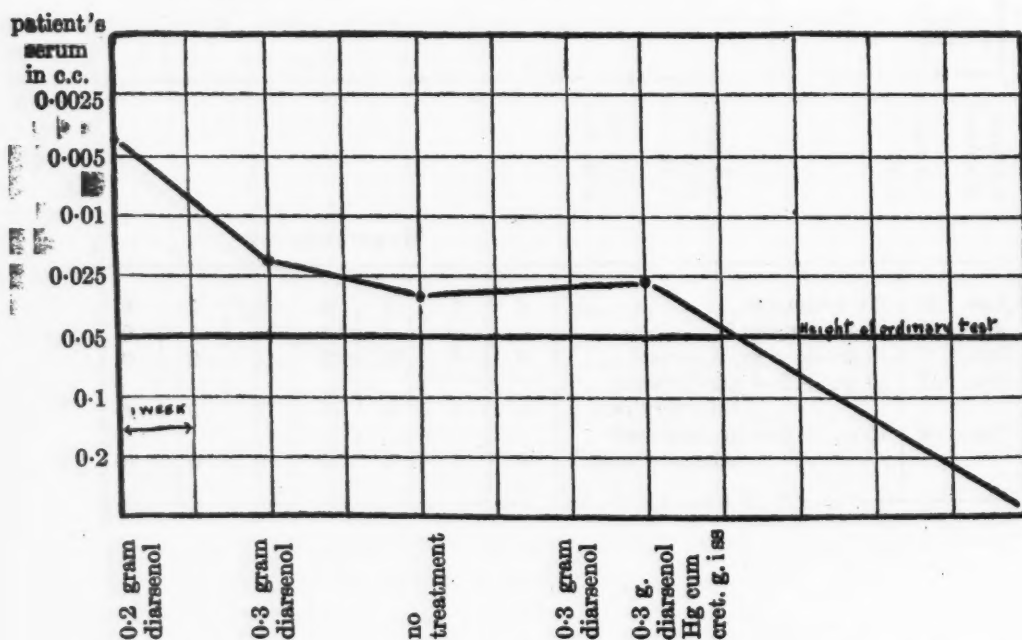
CASE H. H.

TABLE V.—GENERAL PARESIS

		Wasserman test						
Nov. 2	No treatment.....	4	4	4	4	4	0	0
Nov. 9	.3 gr. diarsenol.....	4	4	4	4	1	0	0
Nov. 14	.3 .6 g. diarsenol.....	4	4	4	4	3	0	0
Nov. 27	.3 g. 2-.6 g. diarsenol.....	4	4	4	4	4	1	0
Nov. 30	.3 g. 2-.6 g. i ss gr. Hg.....	4	4	4	4	2	0	0
Dec. 5	2-.3 g. 2-.6 gr.; 3 gr. Hg.....	4	4	4	4	4	1	0
Dec. 11	2-.3 g. 3-.6 gr.; 4 gr. Hg.....	4	4	4	4	1	0	0
Jan. 2	.....	4	4	4	4	1	0	0

CASE E. M.—6778

TABLE VI.—CONGENITAL



		Wassermann test						
Sep 20	No treatment.....	4	4	4	4	4	2	1
Oct. 5	1 diarsenol .2 grams.....	4	4	4	4	1	0	0
Oct. 23	1-.2 g. 1-.3 g. diarsenol.....	4	4	4	3	0	0	0
Nov. 10	1-.2 g. 1-.3 g. diarsenol.....	4	4	4	4	0	0	0
Dec. 18	1-.2 g. 3-.3 g. diarsenol Hg, Cret. gr. i ss.....	0	0	0	0	0	0	0

THE MEDICAL TREATMENT OF OBSTETRIC CASES

BY HARRY C. SWARTZLANDER, M.D.

Oyen, Alberta

WHEN the day of ideal childbirth comes it will be natural and spontaneous delivery of the child through the birth canal without pain or danger to mother or child. Progress made towards the advancement of obstetrics must be made towards this goal. The saying that there has been less progress made in obstetrics than any other branch of medicine is getting time-worn although it is likely true.

Therefore it may be of benefit to us to consider just what advance has been made. The last two meetings of the American Obstetrical Society may be taken as portraying what recent progress has been made in America. We find that they were taken up largely with papers and discussions of maternity hospitals, licensing nurses and the preparation and qualifications of the graduate for this work: in other words, securing ideal conditions for handling this work rather than any progress in the technique or treatment of the cases. Little is or can be said of progress in the management of labour. Our fathers made their diagnoses and managed their cases as well as we do to-day and with as good results except for the use of a few of the drug preparations of recent discovery. It is in these preparations that the entire progress of recent years has been made.

Considering the drugs that are of value to us in this work we find that they practically all fall under two heads: analgesics and oxytoxics—or pain relievers and pain producers—the latter, of course, an undesirable result of our efforts to force dilatation, extraction, and contraction; dilatation of the os, and the dilatation of the canal and the external parts, an area so extensive that general measures are necessary if any relief be obtained. Scopolamine-morphine is the most promising analgesic so far produced and it is to be hoped that further progress will make it of practical use. So

Read at the meeting of the Alberta Medical Association, September 21st, 1916.
Received for publication October 16th, 1913.

far, after a thorough trial the world over, the trend of opinion is towards discarding its use for general practice, and its use is confined to hospitals where absolute quiet and darkened rooms are a necessary adjunct to the treatment. I will not go into the bad effects of this drug in the present state of our knowledge, except to mention that the fact that it interferes with the action of pituitrin is in itself sufficient to bar its use in country practice. H.M.C. tablets, widely advertised and used, are reported to cause asphyxia in the new-born and, especially in the larger doses, will in some cases interfere with the labour pains.

If I use anything during the first stage I prefer heroin in 1-12th grain doses and find it quite satisfactory. The patient rests and the dilatation continues. It is especially indicated where the patient is nervous or hysterical and where the patient has spent a bad ninth month and is hardly fit to go into labour. The amnesia averages about three hours and an examination at the end of that time reveals the cervix thinned and a variable amount of dilatation, but always a reasonable amount more than before the administration of the heroin. It does not interfere with the action of quinine or pituitrin, but these latter interfere with the amnesia and I do not use it where I am soon going to attempt to increase the labour pains. I have not had occasion to repeat the dose and have seen no cases of asphyxia that were not readily accounted for by a hard labour nor is the percentage of asphyxia higher where it is used. In only one case had I any reason to feel that it interfered with the pains. Twenty grains of chloral hydrate per rectum after two inches of dilatation interfered with the labour pains the only time I employed that drug, and I discarded its use as a result.

This leaves us with the general anæsthetics—ether likely is best; but for general work, often single-handed, the difficulty of giving it and attending the patient at the same time makes chloroform the more popular. Chloroform in small doses is the main standby, especially during the second stage. At best, however, these anæsthetics do not produce analgesia, nor eliminate shock, nor do they tend to improve the condition of the patient after labour. A satisfactory anæsthetic must be more prompt in its action, more complete, and leave less bad after-effects—eliminate the vomiting, shock, and not be dangerous to either mother or child in those doses. Theoretically nitrous oxide seems ideal, and very favourable reports are coming from the east of its use. In reasonable doses it may be safely administered by the nurse or one not familiar with anæsthetics. Where death does occur it comes quickly and without

warning, but I have not heard of any mortality when used as it would be in maternity work. In forceps cases or any major work I should prefer chloroform or ether.

This is practically the sum and substance of our analgesics. The remainder of our useful drugs, barring atropine, are the oxytoxics. Of these, three stand out prominently, each for its own indication. For forcing engagements and starting dilatation quinine still holds first place; 25 grains in divided doses will usually in about four hours bring labour to the stage where, if thought advisable, pituitrin may be safely used, and labour terminated. I have been surprised to find, in the last week, that there are many doctors who not only do not use quinine for this indication, but who do not know that quinine is an oxytoxic. Therefore I wish to repeat that as an oxytoxic before the indication for pituitrin quinine stands foremost and that at any time in labour it will force engagement of the head in the pelvis, and moulding of the head better than any other drug. Quinine seems to act as a tonic to the muscle fibres—producing more of a heavy tonic contraction while pituitrin might be called an irritant or excitor of the nerve supply of the muscle cells. While speaking of quinine I wish to mention the indication during the puerperium. I know several surgeons who use quinine as a routine treatment in all cases where there is any chance of sepsis or infection. It is well to remember this indication after any case where interference is necessary. It certainly is of benefit and indicated wherever there is temperature following labour, for it has the two-fold merit of causing contraction of the uterus and of reducing the temperature.

In pituitrin we have the main advance of the last ten years. By pituitrin I mean any preparation of the posterior lobe of the pituitary gland. Its use is general and well understood so that I only need to mention it briefly. I use Parke-Davis' preparation at any time after two inches of dilatation, 1-2 c.c. hypodermically, and have seen no reason why it should not be used this early in those doses. In two distinct cases it was the only thing that would convert inefficient pains into ones forcible enough to cause dilatation. I have used it in about 40 per cent. of my cases. In 5 per cent. the action was not characteristic, and in 5 per cent. the labour had to be terminated by forceps.

I never use ergot till after the third stage. I have seen it used earlier and the pains were expellant to a degree that I do not desire, and considering its tendency to cause an hour-glass contraction I have felt that its use is dangerous before that stage. How-

ever, if the pulse is over 80 following the third stage I always give 1 c.c. by hypodermic at once and if there has been any chance of infection I order fluid extract ergot for two days following labour, and quinine for three days following that, if any indication for further treatment exists.

In the discussions of the 1915 meeting of the American Obstetrical Society the following was advanced to induce labour. In the evening a large dose of castor oil is given. The following morning after the movement, quinine is given in 5 gr. doses to 40 or 50 grs. In about four hours examination will reveal firm engagement and a moderate amount of dilatation. Pituitrin is now given in 1-2 c.c. doses every twenty minutes till labour is finished. It was favourably reported and well recommended. Occasionally it seems advisable to force labour to a conclusion and in closing I wish to report such a case.

CASE 1. Aged twenty-nine years. Two-para, four miscarriages. Extremely hysterical and hard to handle from the time the menses stopped. Both previous labours lasted over twenty-four hours and were followed by six weeks in bed, the first time from an endometritis and the second from a phlegmnasia. Labour started at ten p.m. Saw her at midnight and left instructions that she receive 1-12th grain heroin at 3 a.m. Saw her at eight and found that the patient had rested well and that dilatation was half completed. Ordered four doses of quinine 5 gr. at twenty minute intervals and at eleven found dilatation complete, and the head half descended. Two doses of pituitrin 1-2 c.c. completed the case before noon and the placenta followed in ten minutes. Presentation was an R.O.A. The patient ran a perfectly normal course except for nervousness and was up on the twelfth day and remained up. She was in labour just fourteen hours. I feel justified in saying that from the character of the pains before the quinine was given, she would have had a tedious labour. The heroin worked beautifully—the amnesia lasting longer than the average—securing for both the patient and myself a good night's rest, and at the same time allowing a reasonable amount of dilatation. In judging the effects of all oxytoxics less progress must be expected in primipara and still less in those over twenty-seven years of age. The reason is obvious.

A SATISFACTORY METHOD OF OBTAINING
BLOOD FOR DIAGNOSTIC PURPOSES IN
INFANCY, WITH A PRELIMINARY
REPORT ON LONGITUDINAL
SINUS TRANSFUSION

BY EARL MENDUM TARR, M.D.

Superintendent, Children's Memorial Hospital, Montreal

ROUTINE blood examination, especially in hospital practice, has become a more or less universal procedure. The value of the Wassermann test is so definite that few hospital cases presenting a specific clinical picture escape this confirmatory test and the increasing necessity of obtaining sufficient blood from infants for diagnostic purposes has made it necessary for us to discover, if possible, a more satisfactory method.

The difficulty with which an infant's vein is entered, either directly or after cutting down upon it, is apparent, but only those who have met with repeated failure in the attempt to obtain blood *via* this route appreciate fully the difficulty.

The heel-splitting operation has been practised extensively in some institutions but can never become a popular procedure. Quite recently I admitted an infant to the wards of the Infants' Hospital in Boston and transfusion was necessary to save its life. The heel had been split to obtain blood for a Wassermann and all attempts to control the subsequent hæmorrhage were inadequate. I mention the method only to condemn it.

There is a place, however, that is far superior to all others for the purpose of obtaining blood in sufficient quantity for accurate diagnostic work. I refer to the longitudinal sinus. From an anatomic point of view this is quite accessible. The sinus grows gradually larger toward the back of the head and for this reason it is well to puncture the fontanelle as far posteriorly as possible. The fact that the course of the sinus does not vary and that the landmarks are so definite enables one, with a little practice, to ac-

Read at the Third Regular Meeting of the Montreal Medico-Chirurgical Society, 1916.

Received for publication November 9th, 1916.

comply with ease and certainty, that which has heretofore been a difficult and uncertain procedure.

The simplicity of the method is well illustrated in a recent publication.* An ordinary 5 c.c. Luer syringe and a short hypo needle of rather large calibre are boiled for ten minutes. The infant is wrapped in a blanket and the area over the fontanelle is cleansed with soap and water and alcohol. Shaving is not essential.

With the index finger of the free hand the posterior angle of the fontanelle is located. Keeping in the mid-line the needle is introduced as near the angle as possible. On entering the sinus one gets the same definite sensation of being within the lumen of a vessel as one does in piercing the dura in doing lumbar puncture. Gentle and even traction on the plunger will bring forth a steady stream of venous blood.

In September of 1915 Helmholtz of Chicago published his first paper bearing upon this route as the most suitable for intravenous medication. At this time Dunn and Howell of Boston were using the sinus route for intravenous injections and also obtained blood *via* this route for their routine Wassermann tests.

They found this route superior to all others. Many of their cases were moribund on admission and these babies were all given dextrose solution directly into the sinus. The promptness with which most of them responded was marvelous and I think it reasonable to presume that several lives were saved in this manner.

Bearing in mind the negative pressure within the sinus it is the custom always to withdraw blood before injecting anything, in this way making certain that we are actually in.

The connexions used in the ordinary injection of dextrose solution are as follows: a piece of tubing four inches long, a glass window of about two inches, and another piece of tubing three inches long, into the end of which is slipped the butt of the needle.

The connexion which comes with Parke Davis' serum products is very suitable and can be sterilized in toto. At present I am using one of these connexions.

It has been suggested that one is apt to produce considerable trauma by repeated puncture of the vein. I shall dismiss this supposition by stating that in one case in which I entered the sinus twenty-one times during the course of ten days no evidence of trauma was noted at autopsy. In twelve other cases that came to autopsy

*For plates showing Vincent Tube in use see "*Surgery, Gynecology and Obstetrics*," vol. xxiii, No. V., pages 623-624.

the vein was examined very carefully and not the slightest evidence of a puncture was noted. These cases had been punctured from one to ten times and were all examined within three hours after reaching the autopsy room

To date I have entered the sinus 207 times for blood and have been disappointed but three times. Dextrose solutions have been administered sixty-four times in forty-nine infants. Salvarsan and diarsenol have been administered to eight infants under two and to one child twenty-eight months old. Nineteen cases of so-called acidosis in infants under two years were treated with sodium bicarbonate solution intravenously with fifteen recoveries. One child three years old was given, during a period of five days, 980 c.c. of the solution. Case discharged well on the tenth day after admission. In this case the fontanelle was rather cartilaginous and a gold-plated lumbar puncture needle was used.

For blood transfusion the sinus routine makes the technique so simple that it can be successfully carried out in most cases by the surgeon in the private house without any elaborate paraphernalia. Of the various transfusion outfits on the market there seems to me no doubt but that the one devised by Vincent is the most practical. It is simple, inexpensive, and has met all of the requirements that I consider worthy of mention.

From the communication here offered, as a preliminary report, I feel justified in deducting:

1. That this method of obtaining blood is safe, simple and practical.
2. That it can be done in any home or out-door clinic, as well as in a hospital.
3. That very little assistance and paraphernalia are required.
4. That intravenous medication may be attempted by the general practitioner under ordinary circumstances.
5. That blood transfusion *via* the sinus route offers many advantages over other methods and that transfusion should be added as a therapeutic measure in the treatment of many diseases, including hæmorrhagic disease of the new-born, in primary hæmorrhage, and as Fischer has conclusively demonstrated, in the treatment of toxic and septic acute infectious diseases and in marasmic infants.

It is a great pleasure to acknowledge the valuable association of Dr. Charles Hunter Dunn and William W. Howell and Beth Vincent of the Visiting Staff of the Infants' Hospital. To Dr. Joseph I. Grover I am indebted for many courtesies and helpful suggestions.

NEWER VIEWS ON VENTILATION

BY A. FISHER, M.D.

Superintendent General Hospital, Calgary, Alberta.

THE object of ventilation is surely to provide a continuous and ample supply of fresh pure air, and to ensure the complete elimination and removal of foul air.

What are the qualities of fresh air? To arrive at an answer to this question we will discuss the qualities of air under the following headings:

1. Its chemistry.
2. Its temperature.
3. Air movements.

1. The study of the CHEMISTRY OF AIR will include a consideration of the following factors:

- A. Its chemical composition.
- B. The presence of organic matter.
- C. The presence of dust and of odours.
- D. The humidity.

A. CHEMICAL ELEMENTS. It has always been recognized that the essential element of fresh air is oxygen and we have always been led to believe that foul air was due almost solely to the depletion of the air of its necessary oxygen by the process of respiration, and to the presence of the product of respiration, carbon dioxide, in too great an amount. It is now generally agreed that the oxygen content of the air is not lessened nor the CO₂ content increased in an occupied apartment sufficiently to enter into consideration in the problem of ventilation. This conclusion was first arrived at by Dr. Leonard Hill, F.R.S., the English physiologist. He writes as follows in the *Lancet* of May 10th, 1913:

"It has generally been supposed that all the bad effects of close

crowded rooms and confined places are due to chemical impurity of the air, that the air is contaminated by the exhalation of human beings, and that it becomes impoverished of oxygen; but if we consider what people complain of, we find that people who are in crowded and confined places never complain that there is too little oxygen or too much carbonic acid in the air. What they always complain of is the heat and want of movement of the air. They say 'How close and warm it is! There is not a breath of air.' 'Let us go out and get cool' is the expression one hears in a ball room. The ladies have fans and they put on the thinnest clothing when attending social functions, etc., all showing that what is felt is not chemical impurity, but some other conditions of the atmosphere which affects the heat loss of the body."

EXCESS OF CARBONIC ACID. "Now a great deal is made of carbonic acid in the air but physiological experiment has conclusively proven that the percentage of carbonic acid in crowded rooms has nothing whatever to do with the cause of discomfort for this simple reason that carbonic acid cannot get into the body. The respiration is so controlled by the breathing centre that the excess of carbonic acid (in the atmosphere) cannot enter into the body and the percentage of carbonic acid in the lungs is always kept the same. It is the percentage in the lungs which controls breathing and if we breathe an atmosphere containing say 1 per cent. of carbonic acid, the only result of breathing that atmosphere is that we breathe a little more deeply. We ventilate our lungs a little more in order to keep the normal percentage of carbonic acid in the lungs and the excess of carbonic acid can never get into the body and can never act as a poison, so that we can dismiss carbonic acid altogether. All that carbonic acid can do is to increase the breathing."

DIMINUTION OF OXYGEN. "As to the question of oxygen in the atmosphere, there again the oxygen in a crowded room is never diminished by more than 1 per cent. The cracks and crannies in a crowded room are always such as to let the outside air in. The diminution of 1 per cent. of oxygen has no physiological effect whatever. That is shown by the fact that when you go up in altitude as in the Alps where there are health resorts 5,000 feet high, you will find a diminished partial pressure or concentration of oxygen in the atmosphere. At all those health resorts there is less oxygen by weight in a litre of air (considerably less) than in the most crowded room. . . . Therefore the chemical state of the atmosphere, as far as regards carbonic acid and as far as regards oxygen has nothing

whatever to do with the discomfort which is felt in crowded and confined places and it has nothing whatever to do with the success which results from open air treatment in tuberculosis."

Experiments of the New York State Commission on ventilation nevertheless show the following conclusions in the report:

"The chemical changes in the breathed air of occupied rooms are of comparatively minor importance, but the substances present in such air appear to exert the definite measurable effect, a decrease in the appetite for food. An observation which for the first time offers scientific evidence in favour of fresh air as compared with stagnant air of the same temperature and humidity."

They state that the appetite does not appear to be affected by the introduction of CO_2 in the air supply to the extent of 50 parts in 10,000 parts of air in the experimental chamber.

Appetite and the Chemistry of the Air. In a note from the laboratory of the New York State Commission on Ventilation, Mr. C. E. A. Winslow and Mr. G. T. Palmer report that neither the pulse, blood pressure, body temperature, respiration, nor metabolism is influenced to a measurable degree when human subjects are exposed for long periods to the air of a room in which all the chemical products due to human presence have been allowed to accumulate. This was the case in spite of the carbon dioxide present amounting on the average to over 30 parts per 10,000, but the temperature of the inhabited space was kept down by artificial means. In the course of the investigation, however, a new measure of the influence of vitiated air was discovered which seems to indicate that there is, after all, an effect produced upon the body by the chemical constituents of the air of an occupied room. This effect is manifested, it is stated, in a diminished appetite for food. In the view of the authors the results of these experiments appear to warrant the conclusions that there are substances present in the air of an unventilated occupied room (even when its temperature and humidity are controlled) which in some way, diminish the appetite for food.

B. PRESENCE OF ORGANIC MATTER. Dr. Leonard Hill has tackled this question in such a simple way that there is no doubt about it at all. He takes deep boxes, puts a number of guinea pigs and rats at the bottom and has the lids shut down to such an extent that day and night there is no more than one per cent. of carbonic acid in the boxes. There the animals live every day—they are thoroughly cleaned out and well fed and they live at the bottom of these boxes, breathing in the exhalations of their

own breath day after day, and the ventilation is so arranged, as I said, that at least one per cent of carbonic acid (produced by themselves) is in the boxes. These animals do not suffer. They live week after week. They have been in the boxes for months. They beget young under these conditions. Young ones placed in the boxes under the same conditions exhibit no sign of poisoning; the animals live and grow.

Dr. Hill has also a number of control boxes containing guinea pigs, perfectly ventilated. In the cold weather the ones that were living in the closed boxes were warmer and put on more weight than those living in the well ventilated boxes. The latter may be hardier, if that could be tested, but at any rate there is no sign of poisoning. We may therefore dismiss the chemical organic poison theory. The ill effect of a confined atmosphere is not due to excess of carbonic acid nor to want of oxygen and there is no organic poison exhaled breath. Of course, we get other exhalations besides the breath—in crowded rooms—from the skin, alimentary canal and so on. So do the guinea pigs. So long as the atmosphere is not too warm, Leonard Hill found that rats prefer to sleep in a chamber that has three to four per cent. of carbonic acid in it. They will sleep there rather than go out into the cold, but if some wet bread be put in and if the temperature be raised inside, the rats will come outside, they do not like it. They do not like a high wet temperature. When together they naturally breathe each other's breath. As Hill says, "Every one of us naturally breathes his own breath—because when we exhale we leave the air tubes, nose and so on, full of exhaled air; at the next inspiration we draw back again. We are always inhaling about one third of the air we exhale—exhaled air is not poisonous as regards other exhalations from the body, they certainly make the air smell and although these smells may have a depressing effect on the nervous system, especially of sensitive people, because the imagination plays a great part and has a profound influence upon humanity, that does not prove that these smells are poisonous."

Smells. People who have to deal with smells that are horrible to other people, such as sewer men, men in soap factories, etc., do not suffer ill health as a result. They become immune to these smells.

Every one of us has experienced a disagreeable and sickening sensation when first entering the compartment of a heated, closed up, Alberta railway car in cold winter, especially when the compartment is filled with the great unwashed travelling immigrants, but

if we are seated in the car for a short time we rapidly lose all sense of the disagreeable odour. Bad smells no doubt put one off one's appetite and make one feel depressed and therefore should be gotten rid of, but the way to get rid of smell is not by trying to blow it out by ventilation but by cleaning up the source of it. Hill quotes Pettenkoffer as saying that if there was a dunghill in a room, it was no good trying to blow away the smell by means of ventilation; the right thing to do was to clear out the dunghill. If a room smells it is because the room is not clean, or the bodies of the people or their clothes are not clean. The right thing to do is to clean up the room and the people.

C. DUST. Stagnant dust is bad and moving dust is worse and should of course always be eliminated in any system of ventilation. Dusty air can easily be cleaned of its larger mechanical impurities by the use of air washers and air filters.

D. THE HUMIDITY OF THE AIR. As *temperature*, *movement* and *humidity* are the three important properties of air, the study of the percentage of moisture in the air is of the greatest importance.

Inasmuch as the temperature of the body is regulated by the loss of heat through evaporation of water from the lungs and skin, obviously the humidity of the environment of the body is of no small importance. The term "relative humidity" is used to express the ratio of the moisture actually present in a given space to the maximum amount which this volume can contain at the same temperature. At a temperature of 15° C. (59°F.) and with a relative humidity of 75 per cent.—a high figure—Pettenkoffer and Voit estimated the loss of water by the lungs at 286 grams, and from the skin at from 500 to 1,700 grams daily. This will give some idea of the magnitude of the effects here concerned. If the relative humidity be increased, there will be a hindrance to the escape of water from the body; and when this condition of high relative humidity is combined with a high temperature of the air, the heat is far more oppressive than when the air is dry and allows free evaporation. Conversely, a cold, moist atmosphere may also be distressing.

The complexity of the question of humidity is well exemplified by the statement that very humid air, on the one hand, may prevent the comfortable escape of body heat by evaporation, whereas very dry air, especially when warm, is said to affect the mucous membranes injuriously. It is stated that the air in our houses is too dry in winter, especially in cold weather. An American physicist has called attention to the fact that most of the

current household devices for humidifying the air of houses heated by the hot air furnace are entirely inadequate for this purpose. According to his calculations, "a house containing 17,000 cubic feet of space would require, for a relative humidity of 40 per cent. at 70° F., with air already containing 20 per cent. humidity and changed once an hour, about 15 gallons of water a day. Rarely will the familiar water pans of furnaces evaporate more than 2 or 3 gallons daily—hardly enough to raise the humidity 5 per cent."

Professor Ingersoll, of the University of Wisconsin, has rarely found a humidity of less than 20 per cent. in buildings examined by him. Even allowing for moisture furnished by the exhalations of occupants and for such occasional sources as cooking operations, he maintains that "many gallons of water must be evaporated daily in a moderate sized house in cold weather to secure even 40 per cent. humidity." The latter figure is less than that given by medical writers as an ideal value. The relative humidity of outside air not infrequently passes the 80 per cent. level. Ingersoll found that when a humidity of 50 per cent. was produced by special devices, the condensation accompanying this value in cold weather proved unbearable. He concludes that for a temperature of about 70 F., which our heated rooms approach in winter, the ideal indoor humidity for winter in a climate such as that of Wisconsin is from 40 to 45 per cent. Seventy per cent. would mean the atmosphere of a steam laundry. According to Ingersoll, any recommendations of this value are either based on pure theory or else are founded on measurements with older forms of unreliable and inaccurate apparatus. Precisely wherein the hygienic advantages of a relative humidity of even 40 per cent. lie remains to be explained.

A Minneapolis authority writes in the *Journal of the American Medical Association* as follows: "While very humid air prevents the escape of bodily heat by evaporation, it is true that very dry air, especially when warm, may injuriously affect the mucous membranes. The artificial humidification of air in cold climates is doubtless a most desirable part of a ventilating equipment."

In ventilating a room, the temperatures and humidities should approximate those of the climate as nearly as possible. In England 58° temperature with 60 per cent. relative humidity is common in the school; this would be impossible in Alberta in winter.

Winslow, of the New York State Commission, points out that "very dry air in a hospital operating room might promote harmful evaporation from the exposed body cavity—artificial humidifica-

tion would not only lessen evaporation but would diminish the cooling effect and so make it possible to avoid the extremely high temperatures now generally considered necessary."

2. THE TEMPERATURE OF THE AIR AND ITS EFFECTS

Physiologic studies have shown that air temperature and air humidity have profound effects on the human organisms and in hospitals where we are dealing with persons of lowered vitality these effects must be interpreted. "The whole of the bad influence of confined quarters and the good influence of open air is a question of the heat and moisture of the atmosphere."

Cold exerts a baneful and irritating influence upon many of the acute and even chronic respiratory conditions by irritating the mucous membrane lining to upper breathing passages.

The conclusion has been reached that fresh air at a temperature of 50° to 60° F. exerts a most beneficial influence. The inside temperature of living rooms should be about 68-70° F. At a lower temperature its effect is prone to be detrimental.

The artificial humidification of air in cold climates is doubtless a most desirable part of a ventilating equipment.

Dr. James emphasizes the importance of marked alterations in the temperatures of wards as opposed to the uniform temperature at any one level. His belief in the benefit of such alterations is based on general clinical observations and is ascribed to an action on the vasomotor system.

"The room temperature best liked by the average person seems to bear a fixed relation to the outside temperature and vapour condition." The most suitable temperatures with corresponding outside temperatures up to 66° humidity are as follows, according to Ohmes, a New York Ventilating Engineer:

68° outside 68° inside.

75° outside 72° inside.

80° outside 64° inside.

85° outside 76° inside.

90° outside 78° inside.

3. AIR MOVEMENT.

There is one thing certain that we are not going to get any degree of ventilation without a certain amount of movement in the air. There is no doubt that rapidly moving currents of cool air will increase the loss of heat from the body by convection and by evapora-

ation and this is beneficial provided it is not carried to an extreme degree. The *Journal of the American Medical Association* says "the principle of ventilation by currents is preferable to the principle of ventilation by dilution and smaller volumes of air are sufficient when introduced by currents; convection in the production of currents is effective and economical; upward ventilating currents in crowded rooms are desirable, provided the sources of air supply are free of contamination; the delivery of a certain volume of air per unit of time, per occupant, into a given space does not necessarily constitute ventilation; air introduced into an occupied room in such a way that it strikes the occupants should not be lower in temperature than 60°. If the atmosphere is cool and moving it will continually carry away heat from the skin. It will keep the vessels of the skin contracted; the blood will be driven into the deeper organs where it will be used to build up the body tissues. Moreover the cool moving air acts upon the skin and stimulates the nerves, and the nerves of the skin have a great influence upon our comfort. When we get into confined places the air produces a monotonous uniform temperature of the skin, which organ gets hot, flushed with blood and of a temperature almost the same as that of the body. The sensory nerves are no longer stimulated because there is no change. If, on the other hand the air is continuously moving or blowing, it is continually stimulating the nerve endings of the skin and the nervous system generally and it arouses us to activity, for in order to keep warm we have to use our own body furnace and that is what we ought to do. We do not want to trust to clothes and fires altogether because by that means we are not using the natural body furnace. We do not circulate our blood well, because exercise has a colossal effect upon the circulation. When the muscles are at work, the heart beats more quickly and the blood is carried around the body much more quickly. We breathe more deeply in order to get rid of the carbonic acid and we take in more oxygen, the blood is better oxygenated, the lungs are better expanded and this is an important thing for resisting infection—the expansion and oxygenation of the blood takes place in every part of the lungs. The ventilation of the lungs is increased greatly. Exposure to wind and cold leads to an increased activity in all parts of the body and it is that which has an effect upon tuberculosis."

The velocity of air movement best suited to the requirement of the body is an important question. Although text-books ascribe some eighty diseases directly or indirectly to exposure to cold and

draught, these diseases are usually due to bacterial infection. This question will be discussed in the paragraph on draughts.

Draughts and Colds. Up to recent years most hygienists and physicians held draughts in abhorrence but it is certain that many of the colds attributed to draughts are not due to draughts at all. The ordinary man assumes that draughts are the cause of colds and unless he lives in a hermetically sealed case, he can always find a draught of which he can make a scapegoat. Further it is just in close and stuffy rooms—when the skin is *warm* and *moist*—that a draught is most readily perceived and the *cold* or *bronchitis* ascribed to draught in such instances is almost certainly due to an infection from the germs in the polluted atmosphere of the room and has nothing to do with draughts.

For these and other reasons we must hesitate to accept the ordinary statement: "I sat in a draught and caught a cold." And yet a draught may under certain conditions be a most potent factor in the production of a cold.

An authority in physiology gives the following definition of a draught: A draught is a concentrated current of sensibly cold air impinging upon a localized area of the skin and though it is plain that such a current of air cannot directly cause a "cold" which is a disease caused by bacteria, yet is equally plain that it may well be an auxiliary factor; for it may cool the blood which is circulating in the capillaries of the skin area to such a great extent as to diminish the agents in the blood, that normally fight and throw off disease. Again very sudden and rapid cooling of the skin causes the cutaneous blood vessels to close up quickly and become much narrower, thus preventing much blood from circulating through the surface vessels of the body and then in turn preventing a too rapid cooling of the entire mass of blood in the body. As a result of this precautionary measure on the part of nature, there is bound to be overfilling of the blood vessels in the deeper parts of the body with resulting congestion and sometimes inflammation of the organs supplied by this blood." (*British Medical Journal.*)

If the vessels of the skin are trained to react quickly to cold by resorting to the routine morning cold bath or sponge, the blood will not be cooled so rapidly as it otherwise would be. We must admit therefore that draughts may sometimes in this way be a factor in the production of colds, but the great point to note is that they are merely auxiliaries unless they succeed in cooling the blood unduly; and unless certain germs are present they are as a rule quite ineffective.

It is true that if a man lives constantly in a warm moist still atmosphere and if his skin be continually protected from the normal stimulation of cool moving air, the nerves governing the blood vessels of the skin if unexpectedly called upon, may forget their business and respond sluggishly and inadequately to the stimulation of cold, and that heat may then be unduly lost with deleterious results; but the natural well fed, well clothed human being has active ready reflexes (in the form of nerves supplying the muscles of the walls of the blood vessels of the skin) and is not likely to be unduly chilled by draughts.

"Draughts there must be, draughts there should be and it is much easier to train the blood vessel walls to respond to them and thus prevent undue loss of heat, than to try to escape from the draughts altogether." (*British Medical Journal*.)

It is in stuffy, dirty rooms and churches that draughts are most feared; and there is most reason for fear. In sanatoriums where draughts are large and constant and where bacteria are comparatively rare, colds very seldom occur.

In an article in the *British Medical Journal*, 1911, the writer says, "draughts do occasionally play an auxiliary part in the production of colds but they are easily deprived of their danger and they should be favoured rather than feared." He says further, "to endeavour to escape cold by avoiding all draughts must always be futile and foolish policy and will not only defeat its own aim by fostering bacteria and by promoting vasomotor lethargy and incompetence, but will lead to deficient vigour through interference with the skin reflexes which play an important part in the respiratory and circulatory functions. When we wish to excite the heat centre of the new born babe we appeal to its skin reflexes and in case of night sweats in tuberculosis, a breeze on the skin seems to give tone to the whole vasomotor system."

"The skin is certainly meant to be exposed to moving air currents and to changes of heat and cold, it is surely meant to have a blood supply that ebbs and flows according to the thermal need of the tissues, it is surely meant to perspire and to transpire, and accordingly to shut it off from wind currents and to enclose it in a motionless layer of moist air is to depart very far from the ways of physiological righteousness. The bracing effect of dry air and of seaside breezes are largely due to their stimulating effects on the excretory and reflex functions of the skin; and the man who endeavours to avoid colds by avoiding all draughts will not only catch

more than his share of colds but will possess much less than his share of health and vigour." (*British Medical Journal*.)

Natural versus Artificial Ventilation in Hospitals. By natural ventilation we mean the entrance of "fresh" air into buildings through open windows and doors. In artificial ventilation the outside air gains admission through ducts or conduits and the entrance into the rooms and wards is affected through registers in the walls. In the case of hospitals situated as ideally as the Calgary General Hospital in a large open park, if we can secure adequate cross window ventilation in the wards, natural ventilation should fulfil every requirement, but even in this institution on account of the occasional occurrence of dust storms, we cannot at all times permit our windows to be open. Further, open window ventilation can never be automatically regulated. In wards this regulation will naturally devolve upon the nurses who cannot always be depended upon to employ the care and intelligence necessary. It must be admitted that a number of persons in any wards are rarely in perfect agreement as to the quality and freshness of the confined air and that particularly in the cold season of this northern climate, whatever the cause, the most glaring disagreements exist. This condition is well known and it makes no difference whether the fresh air enters through an open window or is introduced by artificial means. The opening of windows is not objected to when the inside and outside temperatures are about equal or when the latter is higher. If it is some degrees cooler outside than inside and the cold air enters through the windows it mixes very slowly with the warm room air and it sinks to the floor, thus creating a difference of temperature between floor and height of head and chilling of the patient may take place. In addition excessive draughts are at times created by opening windows on dusty days. But with all possible difficulties that we are able to perceive in window ventilation what are we to think of artificial ventilation?

Artificial Ventilation. As these systems have been installed they have not as a whole been satisfactory, but there is no doubt that hospitals erected in crowded centres can scarcely dispense with artificial methods of ventilation. A writer in the *Modern Hospital* says: "A great deal is said of the success of natural ventilation but it may be questioned whether the exponent of such a method considers the nuisance caused by opened windows because of dust and of noise and the effect of the dry air as well as the difficulty of controlling this method."

There are few who do not believe in the importance of a complete artificial ventilation plant for the operating room, the utility and toilet rooms and the kitchens. In the operating room the air supply register should be provided with some form of efficient antiseptic air filter. The toilets, kitchens and utility rooms must be so ventilated that the foul air from them is taken away directly in flues and does not enter the corridors or wards. The withdrawal of air from these rooms by means of a flue provided with a fan may be so worked that a partial vacuum will be produced and air will then be drawn from the adjacent halls. I believe that ultimately the most perfect ventilation of hospitals will be accomplished by artificial methods. If this method is inefficient period flushing of wards with air from open windows may be necessary.

DR. CHARLES WHITE, medical director of the Tuberculosis League Hospital, Pittsburgh, Pennsylvania, has been appointed Director of the voluntary relief work of the health service of the French War Department by the Boston Committee for French Relief. Dr. White is the son of Mr. James White of Woodstock, Ontario.

It is stated that up to the end of December, 1916, the casualties among members of the French medical services were 285 killed in action, 453 missing, and 1,350 wounded.

THE ABILITY OF MOTHERS TO NURSE THEIR INFANTS

BY ALAN BROWN, M.B.

*Attending Physician, Infants' Department, Hospital for Sick Children
and the Infants' Ward, Toronto General Hospital. Director
Department of Child Hygiene, City of Toronto.*

THE present study was undertaken for three reasons. First, the remark made by one of my obstetrical colleagues, that very few of the young women of to-day can nurse, compared with the ability of women twenty or thirty years ago; second, to bring before the practising physician the importance of maternal nursing and how negligent we all are on the insistence of this most vital natural function; thirdly, to endeavour to show the layman the true status of affairs regarding the nursing problem and in this way endeavour to obtain coöperation with their physician in order to prolong the lactation period.

According to Eross, the average mortality, based on figures from thirteen European countries, during the first year of life is 18.33 per cent. The United States census reports give a similar figure. There is, however, as might be expected, considerable variation in different parts of the world. In Ireland it is but 9.4 per cent. and in Sweden 9.7 per cent; in Saxony on the other hand, 28.1 per cent. and in Bavaria 28.7 per cent.; in Russia, according to Gundobin, it is still higher, 32.6 per cent. Budin reports a mortality in the first year for France from 1896 to 1900 of 20.2 per cent.

Every practising physician knows that the greatest number of deaths during the first year is caused by digestive trouble, that this is true is borne out by statistics obtained from all children's clinics throughout the world. In the mortality of Massachusetts from 1892 to 1896 according to Abbott diarrhoeal disorders were responsible for 29.49 per cent. of the deaths in the first year of life. Budin found that 38.5 per cent. of the deaths in the first year in the civic population of France were due to gastro-enteritis. Two years ago it was estimated by the author that in six leading cities in the

Dominion 44.4 per cent. of the infant deaths was caused by digestive troubles, the highest percentage of 57.6 per cent. being in Ottawa.

This brings us naturally to the next point to be considered, the influence of the diet, since it is particularly among the artificially fed infants that gastro-enteric affections prevail. We have reason to expect then that the mortality will be found much greater in the artificially fed. That this is the case is well recognized, but a few figures may serve to illustrate to what degree it is true. In the cases reported by Luling, 14.24 per cent. of the breast fed infants died and 31.42 per cent. to 50.24 per cent. of the bottle fed; and in the 10,000 infants in the first year studied by Westgaard of those that were breast fed 17 per cent. died from gastro-intestinal disease, and of the bottle fed 43 per cent. Of 1,000 infants studied by Armstrong in England but 8.4 per cent. of the breast fed died as against 22.8 per cent. of the bottle fed. Finally W. H. Davies addressed letters of inquiry to a large number of women giving birth to children in 1910 in Boston. The 736 replies showed that only 26 per cent. of the deaths between two weeks and one year of age had occurred in breast fed babies. Roughly speaking, we may say that the breast fed baby has at least five times the chance of living that the bottle fed baby possesses. We may then assume it proved beyond question that the absence of breast feeding is perhaps the chief cause of infant mortality in the first year, as indeed of many deaths occurring in the second year. We may even go further than this and claim that the results of bottle feeding are often much more lasting than this period. Thus Rose studied 164,000 persons with relation to the later influence of the diet which had been given in the first year of life, and found that in many respects the deleterious effects of bottle feeding were often quite discoverable in these individuals, and that even in men capable of military service the difference, to the disadvantage of the bottle fed baby, was very apparent. This observation is by no means an isolated one, similar conditions having been noted by other writers.

With the full understanding of these facts, the importance of the next three topics to which reference must be made is pressed home on us: (1) How many mothers nurse their children? (2) How many are capable of nursing? (3) What is the cause of failure of women to nurse their infants?

The condition varies considerably with the country. In Japan, breast feeding is the rule. In Greenland, artificial feeding is scarcely known, and among the Esquimaux of Alaska there is no cow's milk to be had and infants are often nursed for from two to

three years. In some of the races of Africa, the mother is often helped, if need be, by any of the women of the village, previous parturition, recent or otherwise, not being a necessity, the secretion of milk being gradually established in virgins or in grandmothers by the repeated putting of the child to the breast.

The importance of nursing by the mother is one long recognized by writers. An interesting contribution by Schlossmann quotes the urgent advice given in favour of it by the philosopher, Favorinus, who lived in the time of Trajan. Unfortunately, however, in many of the so-called civilized countries, maternal nursing has undoubtedly decreased greatly in frequency since then. In parts of Bavaria, according to Grassl, hardly 30 per cent. of the mothers give the children the breast. In Berlin, as stated by Neumann, 55.2 per cent. of the infants were nursed in 1885 and only 31.4 per cent. in 1890, showing the great falling off which had occurred in maternal nursing.

Is this failure of breast feeding an actual inability or only an apparent one? Is there in reality a diminishing power of women to nurse their infants? As a result of studies in the obstetrical clinic of Graz, Negris found there existed in only 10 per cent. a physical disability to nurse. In the Stuttgart Clinic according to Martin nearly 100 per cent. do nurse. In Heidelberg, Jaschke observed that whereas in 1904, 64.01 per cent. of the infants were breast fed, in 1907 86.14 per cent, and in some months 97.22 per cent., showing a very decided increase in the ability. Madam Dluski estimated that of 500 women observed in Pinard's Clinic in Paris there were but five in whom it was certain that nursing could have been improved either from the beginning of lactation, or after an interval of continuous effort; and Blackner as a result of studies on 1,000 children in London could only find 2.5 per cent. in whom there was a physical inability to nurse.

With regard to the frequency of breast feeding, whether there is an actual diminution or an apparent one only, some of the figures which have been given are to a certain degree open to criticism. In the first place, many of the statistics are derived from Lying-in institutions, for patients of the poorer classes only, among whom the conditions of life are very different from those which are obtained from among the well-to-do. In the second place, such statistics apply only to the first few weeks of the nursing period, during which the women are under close observation and careful diet and treatment, and we have no means of knowing how many of these women are able to continue nursing, say, for six months or more, or

do so, even if able, after they return to their homes. The important matter to determine, is whether there is a diminution in the actual ability of women to continue nursing or whether the cessation of nursing is a preventable condition. Exact figures bearing on this are not very numerous and there are none published in Canadian literature.

In every locality where propaganda for reform has been instituted there has been an encouraging increase in the number of nursing mothers. Deneke and Thorn, through the aid of midwives, studied the later history of 32,447 infants born in the Magdeburg district in 1907 outside of maternity institutions. It was found that 83.7 per cent. of these were nursed for at least a time and that in 61 per cent. nursing was continued for longer than two or three months. They conclude from their studies that the great majority of mothers are physically capable of nursing their children. Hegar is of the opinion that under careful management 60 per cent. of mothers outside of maternities are able to nurse their children. Kriege and Seutermann in private practice found that 77.9 per cent. nursed from five to six months. Koplik in 1,000 cases in private practice in New York found less favourable conditions, only 40 per cent. were nursed for longer than four months. Marfan, on the other hand, estimated as in his own private practice that two thirds of the women of Paris can nurse satisfactorily and in the other third there is generally a partial power to do so; only about 10 per cent. are actually unable to do so.

The question then of the falling off of maternal nursing feeding can be determined only partially on account of the variation in published statistics; undoubtedly many more women cannot nurse than should be the case among supposedly normal individuals. It is certain, on the other hand, many women who do not nurse are capable of doing so under proper care.

Schwarz of New York demonstrated the importance of supervision of breast fed infants in 1912. The results of 1,500 cases may be seen from Table 3, where through education and proper social regulations of some 1,500 women he was able to keep 63 per cent. of the babies nursing for a period of nine months. He further observed that many multipara were able to nurse their infants successfully when previously they were unable to do so.

The results of my own observations, extending over a period of two years, upon this subject, are summed up in Tables 1 and 2. The cases being divided into three groups: A, Students and nurses, representative of conditions twenty to thirty years ago; B, Private

patients representing middle and upper classes, and C, Clinic cases representing the poor of our city. In all observations were carried out on some 2,079 cases. In Group A the information was obtained through a questionnaire sent to 500 students and nurses requesting them to ascertain whether they were breast fed or not and if so how long. Accurate and reliable information was obtained from 137. In Group B the information was obtained and recorded in my routine private practice and in Group C the information was obtained from the records of the various prophylactic infant clinics scattered throughout the city. From these figures it will be seen that there was approximately 10 per cent. less artificial feeding twenty years ago, that fully 10 per cent. more mothers nursed their infants for three months twenty years ago and that 50 per cent. more nursed them nine months. Another striking feature is the fact that most of the weaning takes place within the first three months which is the period during which the most supervision is essential. Of 250 cases that were weaned in private practice 32 per cent. were weaned purely on account of vomiting or green stools or in other words, excessive feeding. Another interesting feature of these figures is the superiority of the clinic class of mothers over those of the well-to-do.

The effect of intelligent instruction upon the influence of maternal nursing may be noted in Table 2, where it will be seen that in the first four clinics, which were the first established, the percentage of nursing mothers is higher than in the more recently established clinics placed in the newer sections of the city.

Table 3 compares the percentage of nursing mothers among clinic cases with American, foreign and Canadian mothers, and this to my mind is one of the most instructive, for herein should lie our efforts to overcome such a deplorable condition. To my mind there is no excuse and the onus lies first with the physician and nurses and secondly with the women themselves to see that such conditions be remedied for the good of our future citizens.

Some of the statistics of maternities quoted are at best a clear indication of the general change which it is to be hoped is taking place. The clearly increasing number of women in some of these institutions who now nurse their children, as compared with the conditions a few years earlier, indicates that a similar increase of frequency of nursing is to be looked for in patients outside of the institutions. Certain it is among the more intelligent classes and even among the poorer under the influence of the awakened conscience of physicians and the instruction which mothers receive from the various sources, there is a growing earnest desire of women to

nurse their children, and it would seem an increasing frequency of maternal nursing.

This brings us to our last question. What is the cause of the diminution of breast feeding which has shown itself in many regions? Beeng believes that there is an increasing actual physical disability of the mothers to carry on maternal feeding, which he attributes largely to the continual use of alcohol by civilized races. Whatever the cause, there is good reason to believe that there is a physical disability to a certain extent and that this disability may be transmitted by inheritance. Most investigators, however, think that the cause of failure to nurse is to be sought rather in the unwillingness of the mother instigated or abetted often by the advice of nurses and physicians. Hegar expresses this clearly in attributing the inability to nurse to the influence of generations of undervaluing of maternal feeding. The introduction of the numerous methods of artificial feeding led easily to the conviction that nursing at the breast was unnecessary and an onerous affair. Ziegenspeck points out that in Germany, where the preparation of artificial foods and food mixtures has long thriven, dating, as we know, at least from the time of Melhinger, maternal nursing has suffered proportionately.

Among the working classes, undoubtedly poverty is a frequent cause of the desire to avoid nursing. It is often imperative for the mother to work, and she cannot well do this and attend to the infant also. In other cases lack of suitable nourishment for the mother causes a failure in the secretion of milk. The remedies for these difficulties are to be found only in sociologic aid. In other cases it is the complete ignorance of the mothers regarding the importance of breast feeding which leads to gross indifference in the mother and this applies to all classes of society. Only constant instruction of the people can remedy this. The splendid work of the Consultations de Nourissons founded in Paris and the similar prophylactic baby clinics scattered throughout this city and the many cities throughout the States has by this instruction increased maternal nursing and generally emphasized the importance of the hygiene and feeding of the infant. In the upper classes there is undoubtedly often seen an inability to nurse dependent on the more highly organized and hence more easily disturbed nervous organization of the mother. Here, too, is the influence of early mental forcing, early enjoyment of social life, with late hours and the like. Faulty methods of dressing have doubtless in the past been the cause of many hopelessly depressed nipples.

The numerous stated contra-indications to nursing are more

fancied than real; actual contra-indications are few, and physicians should learn to appreciate this fact. Here, especially, the obstetrician who is thoroughly grounded in the importance of breast feeding can be of the greatest assistance since he is so early associated with the mother and can exert a great influence over her. Certainly many obstetricians in the past have paid all needed attention to the mother, but far too little to the infants. This is a reproach often made, but one which I hope is passing away. There can be no good substitute for mother's milk and this the obstetrician should impress on the mother with all his power.

Finally in this connexion, it must never be forgotten that inability to nurse or inability on the part of the infant to digest its mother's milk can never be determined by a brief trial. It is only after a prolonged and repeated and again repeated efforts that we can reasonably conclude that weaning is necessary. Here the fault lies with the physician, since they are, as a rule, far too ready to abandon their efforts. The mother is perhaps clamorous for weaning, and it is easy to move in the path of least resistance. Many a time the breast which at first gives insufficient milk, will later render an abundant supply, and the infant's digestion, at first much disturbed, will accustom itself perfectly after a while.

In conclusion I think it may be claimed:

1. That Canadian mothers nurse their infants less than do either American or foreign born women.
2. That the well to do of this city and environs nurse their infants less than do those of the poorer classes.
3. That maternal nursing is less to-day than it was twenty or thirty years ago in Canada, but in view of recent enlightenment is certainly on the increase.
4. That the infrequency of nursing depends chiefly on the ignorance of the laity and the indifference of the physician. It is our duty as physicians to remedy these evils.

In conclusion I wish to express my indebtedness to Dr. K. C. McKilwraith for suggesting the subject, and to Doctors Smith, Mitchell, McBroom, Ogden, Morrison, Hume, Davis, Bond, Fotheringham and Tisdale for assistance in collecting the figures from their respective infant clinics, and last but not least to the public health nurses of this city through whose efforts this study has been made possible.

TABLE I.

	Number of cases	Per cent. Artifi- cially fed from birth *	Per cent. Nursing up to 3 months †	Per cent. Nursing up to 6 months ‡	Per cent. Nursing up to 9 months §	Per cent. Nursing over 9 months
Students and nurses . .	137	12.4	87.6	84.7	76.6	29.9
Private patients	633	24.0	76.3	46.7	30.4	9.8
Clinic cases	946	16.53	79.65	60.51	31.88	...

* Approximately 10 per cent. less artificial feeding twenty years ago.

† Approximately 10 per cent. more nursing twenty years ago.

‡ Approximately 30 per cent. more nursing twenty years ago.

§ Approximately 50 per cent. more nursing twenty years ago.

Present day nursing figures in comparison with those of over twenty years ago. Of 250 cases weaned in private practise, 32 per cent. were weaned on account of dyspeptic symptoms and the remainder did not have enough.

TABLE II.

NURSING STATISTICS FROM THE VARIOUS DISTRICTS IN TORONTO

	No. of cases	Per cent. nursing 1 to 3 mos.	Per cent. nursing 3 to 6 mos.	Per cent. nursing 6 to 9 mos.	Artificially fed from birth
1. Down Town	175	93.7	65.7	48.0	6.2
2. Central Toronto	41	90.2	75.6	39.0	9.7
3. West Toronto	171	81.2	67.1	52.6	18.7
4. East Toronto	45	93.3	53.3	43.3	6.6
5. West Central	178	74.4	54.5	41.5	25.5
6. North Toronto	136	76.4	50.7	38.9	16.1
7. North West	45	75.5	55.5	33.3	24.4
8. Central Toronto	16	75.0	75.0	18.7	25.0
9. West Central	114	86.8	51.7	17.5	13.1
10. North Toronto	25	80.0	36.0	16.0	20.0

TABLE III.

COMPARISON OF BREAST FEEDING RESULTS IN AMERICAN-BORN, FOREIGN-BORN AND CANADIAN-BORN WOMEN

Breast feeding	American Mothers Percentage	Foreign Mothers Percentage	Canadian Mothers Percentage
One to three months.....	83	88.1	79.6
Three to six months.....	63	77	60.5
Six to nine months.....	63	70.3	31.8

A CASE was recently brought by the Alberta Medical Association against Jean Louis Gillier for practising medicine without a license. The defendant had opened a hydro-physiotherapeutic institute at Athabasca where he gave a certain treatment which he described as an "absolute treatment, being the application of cold and heat, which permeates the skin, restores the circulation, and removes the morbid condition of the body." He stated that he was born in France, had graduated from the Paris Academy, and had been duly registered as a practitioner in France, England, Russia, and the United States. He was fined \$20 and costs.

Editorial

RETURNED INVALID SOLDIERS

INFORMATION has reached us just as we are going to press, that as a result of a conference between the Minister of Militia and the Army Medical Service on the one side, and Sir James Lougheed and the Military Hospitals Commission on the other, it has been agreed that in future, medical control of the returned invalid soldier shall be wholly in the hands of the Army Medical Corps, while the provision and maintenance of the necessary Hospitals, Convalescent Homes, and Institutions for special orders of cases together with physical training and reëducation of the convalescents shall remain in the hands of the Military Hospitals Commission. We are heartily glad that at last this agreement has been reached: from the point of view of the Medical profession it is the only possible arrangement.

We can well understand and sympathize with the movement which led to the establishment of the Hospitals Commission. In the summer of 1915 the greater number of the officers of the Permanent Army Medical Corps had of necessity gone overseas together with the greater number of the old and experienced members of the Army Medical Service connected with the Active Militia. The Acting Director-General of Medical Services, and those left behind to undertake the medical administration of the different districts, were too few in number, and too busily occupied with their clerical and other duties to take up with any prospect of success, the heavy work of establishing military hospitals and convalescent homes for returned invalids in the different districts. Indeed, at that period what was needed was not the provision of hospitals for active treatment so much as of convalescent homes. What

was needed for this purpose was a body of representative men well known in the different provinces, each of whom might stimulate the provincial and municipal bodies in his district or province to coöperate with the Government in obtaining the necessary accommodation and equipment. As a matter of fact, the Military Hospitals Commission has accomplished notable work in this particular direction, although they still have much to accomplish. There was a general understanding that the Army Medical Corps would be responsible for the care and treatment of men in the Expeditionary Force who had not left Canada, whereas the Military Hospitals Commission would be responsible for the care and treatment of the men of the Canadian Expeditionary Force who had returned from service overseas. So long as the returned soldiers were of the convalescent class this understanding worked well. With the great number of casualties in the British Expeditionary Force during the latter part of last year, and in addition the possible need of emptying the British Hospitals in anticipation of a Spring campaign, the inherent difficulties of the understanding have made themselves felt more and more acutely, as during the last few weeks more and more men have returned to Canada who need active hospital treatment.

For the Military Hospitals Commission to undertake the active treatment of men returning to Canada without their treatment having reached finality, there was forthwith established the need for the development in each district of a double service. Now with some 1,300 Canadian medical men overseas with the Canadian Expeditionary Force, and another 400 medical men overseas with the Royal Army Medical Corps, it has been difficult enough to get an adequate supply of capable practitioners to carry on the work of the Canadian Army Medical Service alone. To duplicate the staff in every town of any size was as impossible as it was uneconomical: in fact, the only sensible solution has now been reached whereby such duplication will be prevented. It is proposed to appoint a new officer to be known as Director of Medical

Services to Invalids, who shall deal particularly with the medical treatment of returned soldiers, and the name of Colonel Fotheringham is mentioned in this connexion. Colonel Fotheringham has had wide experience both as A.D.M.S. of the 2nd Military District in Canada, before the War, and A.D.M.S. of the 2nd Division at the Front, where by his energy and ability he has added to his already great reputation.

The new arrangement demands that the Army Medical Service here in Canada must be augmented. This is evident when as we write, we hear that 1,500 returned invalids are reaching Canada this week, and that in a few weeks 10,000 will have been returned. We have no doubt but that those members of the profession who for one or other reason have been detained at home, will volunteer to join the Army Medical Service loyally and with good will.

THE MARLOW MEDICAL REPORT

AT the same time that the late Minister of Militia appointed Colonel Herbert Bruce to report upon the work of the Canadian Army Medical Service overseas in Great Britain and France, he appointed Colonel Marlow, A.D.M.S. Toronto Military District, Inspector of the Canadian Expeditionary Force, to report upon the work of the Army Medical Service in Canada. As Inspector, Colonel Marlow visited various Military Districts and their hospitals and other institutions, and rendered his report to the Minister early in October, at the time when the late Minister was still overseas. The crisis produced by the report of Colonel Bruce led to Colonel Marlow's report being overlooked.

It was a straightforward report: a report recognizing fully the difficulties of the situation, giving credit to the Acting Director-General of Medical Services, Colonel Potter, for his indefatigability in the performance of his duties, and making several recommendations in a sympathetic spirit, and in a

manner to which none could object. There was, in fact, nothing in the report calculated to afford material for the Minister to attack any one, or for the daily press in search for "good copy" to reproduce in extenso. We cordially sympathize with Colonel Marlow for the little notice that has been taken of what was a careful and useful piece of work on his part. At the same time we would point out to him that it is contrary to military usage that reports of this nature should be published. This report, in fact, has only been made public at a meeting of the Parliamentary Committee upon Returned Soldiers which had its sitting during the last week in February. It deserves note that of the twenty or more recommendations made by Colonel Marlow, the greater number had already been under the consideration of the Adjutant General and the Militia Department.

As for the duplication through the appointment of the Military Hospitals Commission which Colonel Marlow adversely criticized, that has at last been settled in what we trust is a satisfactory manner. The matter of recruiting those who are medically unfit has from the first received the attention of the Department. We agree with Colonel Marlow that the blame for recruiting men who are medically unfit rests not upon Regimental Medical Officers, but upon the system of regimental recruiting, the Commanding Officer being only too anxious to secure men by hook or crook. Now that the system has been replaced by draft recruiting, this blot upon the Expeditionary Force should be removed.

With others of his recommendations we cannot wholly agree: the advisability of providing for term contracts of service such as obtains in the Royal Army Medical Corps, and the replacement wherever possible, of the use of Civil Hospitals by Military Hospitals in each district. Regarding the former, looked at from a service point of view, were appointments to the Canadian Army Medical Corps for one year to be established, it would lead to profound dissatisfaction and discontent. Men who have already served for eighteen

months or two years or more would regard it as their right to resign forthwith, to the extreme disorganization of the work overseas.

As regards the hospitals, since Colonel Marlow's report was published his very district has afforded an example of the wastage that may be caused by establishing large Military Hospitals in each district. The old Toronto General Hospital buildings were taken over to form a Military Hospital. In the first nine months of 1915-1916 there were abundant troops in the district, and the arrangement seemed admirable; during these winter months, however, with few troops left, the hospital has been largely empty and the staff only partially employed. On the whole, the utilization of existing institutions would seem to be the more economical process, even if the cost of the individual patient per diem is higher. Under present conditions it is those already on the staffs of local hospitals who are most likely to be asked to undertake the care of returned soldiers. Military patients are likely to receive more efficient treatment, therefore, in the institutions at which these officers attend regularly, than they would receive from the same officers at a military hospital at a distance. We shall have, that is, in the future to depend upon the part time services of local practitioners, and it is better to expand than to duplicate their work.

"THE R. P. CAMPBELL MEMORIAL FUND"

ONE of the greatest losses which Canada has sustained during the conflict in Europe was through the untimely death of the late Dr. R. P. Campbell (Lieutenant-Colonel, C.A.M.C.) on the battle-field in France, where he was engaged in rendering aid to our afflicted heroes. In view of the high esteem in which Dr. Campbell was held both by the profession and laity, his confrères on the staff of the Montreal General Hospital, with the coöperation of some of his personal friends,

have decided to perpetuate his name by the establishment of a fund for the training of young medical men. This fund is to be called the "R. P. Campbell Memorial Fund" and will be under the joint control of the Committee of Management and the Medical Board of the General Hospital, for the special training of nominees of the Medical Board for positions on the attending staff of the Hospital, using only the income arising from the fund. The Genito-Urinary Department is to have first claim upon this money, which may, however, be devoted to other departments as occasion arises.

The first idea of the Committee, having this matter in hand, was to found a scholarship at McGill University but upon further consideration it was thought more suitable to devote the memorial to the institution with which Dr. Campbell had identified himself practically from the date of his graduation and in which he had done such good work. This view has been most heartily endorsed by the members of Dr. Campbell's family.

The Committee consists of Messrs. Robert Harrower and F. E. Walker, together with Drs. W. L. Barlow, F. A. L. Lockhart, F. J. Patch, A. R. Pennoyer, and E. M. von Eberts. Subscriptions may be sent to Lieutenant-Colonel F. J. Patch, 33 Bishop Street, Montreal, who is the treasurer of the Fund.

THE ANTITOXIN LABORATORY OF THE UNIVERSITY OF TORONTO

PREVIOUS to May, 1914, with the exception of smallpox and typhoid vaccines, none of the auxiliary weapons of a preventive or curative nature, with which the physician is armed in his fight against communicable diseases (diphtheria, meningitis, etc.), were prepared in Canada. This condition of affairs was not considered desirable, and various medical organizations, including the Canadian Medical Association and the Canadian Public Health Association, had urged the Federal Government to establish a laboratory for

the preparation of these biological products, including diphtheria and tetanus antitoxin, anti-meningitis serum, anti-rabic vaccine (or the Pasteur treatment), and smallpox vaccine. It was further suggested these products be distributed throughout Canada, free of charge, or at a nominal cost. No action of any sort, governmental or private, was taken until 1914.

During the winter of 1914, Dr. J. G. Fitzgerald, the director of the laboratory, with the very cordial and hearty co-operation of Sir Edmund Osler, chairman of the Medical Section of the Commission of Conservation and a Governor of the University of Toronto, undertook to establish a laboratory in the University of Toronto, where these products could be prepared and distributed at cost. In May, 1914, the laboratory was formally opened.

It may be wondered why it was desirable to establish such a laboratory if these products could be freely imported from the mother country or from the United States. The important reasons were three in number. The first of these was that no country in the world of the size of Canada is without laboratories for the purpose. Secondly, the supply of a given product at any time might be insufficient and difficult to obtain; the outbreak of war in August, 1914, and the subsequent great shortage of tetanus serum, illustrated this point. And finally there was the strongest reason of all, the economic reason.

The preparation of these substances requires the services of especially trained experts versed in the methods of immunity. Few such men are obtainable. Then the equipment of laboratories, stables, and so on, is costly and the profits of producers, middlemen and retailers meant that the antitoxin when purchased by the ultimate consumer was very expensive.

The entire success of treating diphtheria antitoxin depends upon the early use of large doses. The use of diphtheria antitoxin in this way in New York State has reduced

the death rate from diphtheria from 99 per 100,000 in 1894 to 20 per 100,000 in 1914. It is true that the larger municipalities and hospitals were able to obtain antitoxin at special rates from the manufacturers, that is to say those who were best able to pay were charged the least and, conversely, those whose need was often the greatest and whose purses were slim, were not so favoured. Immediately the Antitoxin Laboratory began the distribution of its products, a dose of diphtheria antitoxin was made available for thirty-five cents, which previously had cost one dollar.

The enterprise at once received every encouragement from several provincial and municipal Boards of Health. The first of these was the Provincial Board of Health of Ontario, which through its Chief Officer of Health, Major J. W. S. McCullough, arranged for distribution through all local boards of health in Ontario of various antitoxins and serums at greatly reduced prices. Dr. M. M. Seymour, Commissioner of Health for Saskatchewan, and Dr. W. H. Hattie, Provincial Health Officer of Nova Scotia, did likewise for their provinces. Several other provincial and local Boards of Health announced their intention of supporting the Laboratory, and soon the movement became national in scope. The Colony of Newfoundland, though outside the Dominion of Canada, is in "the sphere of influence" of the Antitoxin Laboratory, and for two years past all diphtheria antitoxin used in that far away island has come from the Antitoxin Laboratory of the University of Toronto.

The next step in the work was the very advanced and progressive action of the Provincial Board of Health of Ontario when they decided, commencing February 1st, 1916, to distribute free of charge in Ontario, diphtheria antitoxin, tetanus antitoxin, meningitis serum, rabies vaccine (the Pasteur Treatment) and smallpox vaccine. This move put Ontario in the van in public health work and meant that henceforth no child's life should be lost because the parents could not afford to buy antitoxin. No other movement in

public health work in Canada within the past decade has received such general endorsement as has this action on the part of the Provincial Board of Health of Ontario.

To keep pace with the work in the preparation of small-pox vaccine, the Antitoxin Laboratory in January, 1916, acquired the plant and good-will of the Ontario Vaccine Farm, Palmerston, from Dr. Coleman.

Meanwhile with the outbreak of war the work of the Laboratory was greatly increased. As has already been pointed out, soon after war was declared there was a great shortage in the world's supply of tetanus antitoxin. This was due to the fact that enormous quantities were required in the Western theatre of war. Within the first three months of the war, there were a great many deaths amongst the wounded from lockjaw. The medical authorities of the various armies decided that in future all wounded men were to receive a protective dose of tetanus serum. Immediately there was a cessation in the number of cases of tetanus observed, and deaths from this dread disease amongst those injected became a rarity. To accomplish this, enormous quantities of tetanus antitoxin were required, and an acute shortage soon occurred.

At this juncture, in the early spring of 1915, the Canadian Red Cross Society had been urgently requested to obtain ten thousand doses of the antitoxin and to send this amount to France. They endeavoured to do so, and found that the lowest price at which serum could be obtained from any manufacturer in the United States was one dollar and twenty-five cents a package. At once arrangements were made with a large municipal public health laboratory in the United States to obtain the much needed supply for the Red Cross Society. It was found that for the price of sixty-five cents each, the ten thousand packages could be obtained. This saved the Red Cross Society approximately one half the amount they proposed to spend.

This incident focussed the attention of the Laboratory on the necessity, if at all possible, of at once undertaking the

preparation of this serum. A member of the Board of Governors of the University of Toronto, Colonel A. E. Gooderham, who is also a member of the executive of the Canadian Red Cross Society, at once offered to equip a laboratory for the purpose of producing tetanus antitoxin. At the same time, the Department of Militia and Defence agreed to make a grant of five thousand dollars on the condition that the entire output of the antitoxin would be available for the use of the Department if they required it. The Antitoxin Laboratory gladly agreed to this and went further and promised to supply tetanus antitoxin at approximately cost price. The special laboratory was at once established under the immediate direction of Dr. R. D. Defries, and for nearly a year and a half has been preparing and sending to France all the tetanus antitoxin required for the use of the Canadian Expeditionary Force, at a price lower than the lowest price quoted by any American manufacturer of tetanus antitoxin. Since the Laboratory began this work over seventy-five thousand packages have been sent overseas.

The work of the Laboratory was much hampered at the outset by the lack of accommodation for horses and other necessary laboratory animals, and because the University did not possess a farm, the horses could not be kept under the best possible conditions. Also the available laboratory space was inadequate. When this became known to Colonel Gooderham he promptly increased his gift many times and purchased a fifty acre farm in York Township about twelve miles north of Toronto. On this farm a magnificent laboratory and stables have been built through Colonel Gooderham's generosity, and the whole property given to the University. H.R.H. the Duke of Connaught has been much interested in this work, and has graciously consented to the laboratories being called the Connaught Laboratories of the University of Toronto. The future work of this department therefore will be conducted under ideal conditions, provided for in a truly splendid fashion by Colonel Gooderham.

Canada now has an institution which is comparable in the scope of its activities to the Serum Departments of the Pasteur Institute, Paris, the Lister Institute, London, and the Research Laboratories of the Health Department of New York City, respectively. These all derive a large part of their support from the preparation and sale of public health biological products, which are supplied to boards of health at low cost. The proceeds above the amount actually required to run the laboratories are used to further research in preventive medicine. As soon as the war is over this is to be done in the Antitoxin Laboratory of the University of Toronto. At present all the energies of the Laboratory are being bent in the direction of war work, since this is the duty of every loyal Britisher to-day.

A MEETING of dentists belonging to the allied forces was arranged by the Paris Dental School and was held at La Tour d'Auvergne from November 10th to 13th, 1916, for the purpose of discussing dental questions which have arisen in connexion with the war. The meeting was well attended and over nine hundred names were enrolled. A number of cases were presented and an interesting exhibition of photographs, radiographs, and so on had been arranged. Over one hundred and fifty communications and reports were read. Monsieur Justin Godart, Sous-secrétaire d'état du service de santé, was in the Chair.

THE treatment of war wounds by means of soap is recommended by Drs. Ratynski and Bergalonne of Paris. A 20 to 40 per cent. solution of white castile soap in warm water is prepared, in which sterilized gauze swabs are dipped and employed to cleanse the surface of the wound which is then freely irrigated with the soapy water and covered with a compress composed of from sixteen to twenty thicknesses

of gauze which have been previously soaked in the solution and rubbed vigorously against a piece of soap until they are saturated, then rolled between the palms of the hands until an abundant lather is formed in the interstices. The dressing is finished with a thick layer of absorbent cotton and a bandage. This dressing requires renewal every two or three days, but when changed does not adhere to the wounds or the neighbouring parts and is readily detached without causing any oozing. Remarkable diminution or total disappearance of pain and rapid healing of the wounds has been found to result from this form of treatment.

EARLY in the war the new buildings at Studley, which at that time were not fitted up as laboratories, were offered to the Military Hospitals Commission by the Governors of Dalhousie University. Although this offer was not accepted at the time it was made, the University has now been requested to allow the Commission to use the old Dalhousie building on Carlton Street in which the Faculties of Law, Medicine, Dentistry and Pharmacy are at present housed and at a recent meeting of the Board of Governors it was decided that this should be done. Such a course, in the middle of term time, naturally involves a good deal of disorganization and, to the Medical Faculty, the possible destruction of valuable and delicate apparatus, but the fact that the University is willing to make such a sacrifice in addition to what it has already done is in keeping with the splendid spirit of patriotism manifested by the universities of Canada ever since the beginning of the war.

Canadian Medical Association

THE MONTREAL MEETING

PREPARATIONS for the Annual Meeting in Montreal, June 13th, 14th and 15th, are advancing steadily. The chairmen of the Sections have received a number of replies to their appeal for papers, and everything points to a most interesting and profitable time for those who may be able to attend. It is especially requested that those of our members who may have something of interest to communicate send the title of such communication either to the General Secretary or to the Chairman of the Section in which they wish it to appear, at the earliest date possible. Every member of the Association should make it a point to be present, and we hope that an effort will be made by each of our members to interest the physicians of his neighbourhood in the meeting.

Montreal is now one of the great hospital centres of this continent and visitors are always made welcome by the physicians and surgeons in charge of the clinics.

We would ask our members to pay particular attention to the instructions printed below, on the question of special railway rates and how to obtain them.

RAILWAY RATES

The usual reduced rates are being arranged on all the leading roads terminating in Montreal. These rates will be available for doctors attending the meeting and also for members of their families accompanying them. In order to take advantage of these reduced rates it will be necessary for the physician when starting on the journey to obtain from his ticket agent a standard certificate, properly filled in and signed by the latter. These certificates must be presented to the Secretary of the Association after arrival in Montreal, and also to a special agent of the railways, who will be in attendance on certain days, which will be specified in a later issue. Twenty-five cents will be collected by the Agent for each certificate which, when signed by him will entitle the holder to a return ticket to his starting point, either without further charge, or at the rate of one-third, or two-thirds fare, depending upon the number attending the meeting. Further particulars will be published in a later issue.

Miscellany

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

MEDICAL AND SURGICAL REPORTS OF THE EPISCOPAL HOSPITAL. Edited by ASTLEY P. C. ASHHURST, M.D. Vol. III. Philadelphia: Press of Wm. J. Dorman, 1915.

FOCAL INFECTION: THE LANE MEDICAL LECTURES. By FRANK BILLINGS, Sc.D., M.D. Delivered on September 20, 21, 22, 23, and 24, 1915. Publishers: D. Appleton and Company, New York and London, 1916.

THE PRACTICAL MEDICINE SERIES: COMPRISING TEN VOLUMES ON THE YEAR'S PROGRESS IN MEDICINE AND SURGERY. Under the general editorial charge of CHARLES L. MIX, A.M., M.D., professor of physical diagnosis in the Northwestern University Medical School. Vol. VII, OBSTETRICS, edited by JOSEPH B. DE LEE, A.M., M.D., professor of obstetrics Northwestern University Medical School; with the collaboration of HERBERT M. STOWE, M.D., assistant professor of obstetrics, Northwestern University Medical School. Vol. VIII, MATERIA MEDICA AND THERAPEUTICS, edited by GEORGE F. BUTLER, Ph.G., A.M., M.D., emeritus professor of therapeutics, Chicago College of Medicine and Surgery. PREVENTIVE MEDICINE, edited by WM. A. EVANS, M.S., M.D., LL.D., Ph.D., professor of preventive medicine, Northwestern University Medical School. Series 1916. Publishers: The Year Book Publishers, 327 S. La Salle Street, Chicago. Price, \$1.50 net. Price of the series of ten volumes \$10.00.

Obituary

LIEUTENANT-COLONEL McLEOD, M.D.

LIEUTENANT-COLONEL RODERICK CAMPBELL McLEOD, who died at Bramshott on January 4th, was in command of No. 9 Stationary Hospital, the unit contributed by St. Francois Xavier University, Antigonish, Nova Scotia. This hospital was offered to the military authorities rather more than a year ago and, upon its acceptance, was mobilized under the direction of Lieutenant-Colonel McLeod, who proceeded with the unit to England. In October of last year Colonel McLeod, with his unit, took charge of Bramshott Military Hospital, and it was there that he succumbed, after twenty-four hours' illness, to an anthrax infection communicated by a shaving brush through a trifling razor abrasion on the face. His son, Lieutenant McLeod of the Highland Brigade, was in England at the time. Roderick C. McLeod was a Scotch Highlander by extraction. He was born at Margaree, Cape Breton, in 1865, and was educated at Pictou Academy and at St. Francois Xavier University, and graduated in medicine from the University of New York. He had been in practice at North Sydney for over twenty years.

CAPTAIN W. W. McKENZIE, C.A.M.C.

CAPTAIN W. W. McKENZIE, who died suddenly at the Shorncliffe Military Hospital, was the only son of Mr. Thomas McKenzie of Toronto. Born in Toronto, W. W. McKenzie was educated at the Parkdale Collegiate and entered the University of Toronto as a student of medicine. He graduated in the spring of 1914 and became medical officer at the Hamilton Hospital for the Insane. In April, 1916, Captain McKenzie went to England as medical officer of the 83rd Battalion and was in camp at Shorncliffe for some time. He was transferred to the staff of the Shorncliffe Military Hospital a short time ago. Captain McKenzie was in the twenty-sixth year of his age and was unmarried.

WALTER BAYNE GEIKIE, M.D.

IN the death of Dr. Geikie, which occurred at Toronto on January 12th, at the ripe age of eighty-six years, a leading figure has

been removed from the medical profession of Canada. Generously endowed by nature with tremendous vitality and a keen intellect, Dean Geikie, as he was affectionately called, inherited from his Scotch ancestors a pertinacity and steadfastness of purpose that carried him over many difficulties in a long and eventful career devoted to the interests of medical education. As the founder of Trinity Medical College and Dean of the Faculty for many years, Dr. Geikie came into contact with numbers of students, who recognized in him a friend worthy of their deepest respect and affection. He threw himself heart and soul into his work and, as a teacher, was particularly gifted with the power of assimilating information and conveying it to his students.

Walter Bayne Geikie was born in Edinburgh in 1830, the son of Rev. Archibald Geikie, who came to this country in 1843. He was licensed as a practitioner by the Medical Board of Upper Canada in 1851, having graduated from Victoria University. The following year he received the degree of M.D. from Jefferson Medical College, and in the course of a successful career was the recipient of many honorary degrees from universities in Canada and the United States. In 1856 Dr. Geikie became professor of materia medica in Victoria University, Cobourg, where he was associated with the late Dr. John Rolph, and later was appointed to the chairs of anatomy, surgery and mid-wifery. In 1870 he severed his connexion with Victoria University and a year later suggested the establishment of a medical faculty in Trinity University, Toronto, which, in 1877, was incorporated under an independent charter as the Trinity Medical College. From 1878 to 1903, Dr. Geikie was Dean of the College and professor of medicine and clinical medicine. Under his able direction, the work of the College rapidly developed and its amalgamation with the University of Toronto was a great blow to him.

Dr. Geikie was an early member of the College of Physicians and Surgeons of Ontario and served on the Council from 1877 to 1902; in 1882 he was appointed vice-president. He was president of the Union Loan and Savings Company for some time, and for twelve years was president of the Toronto City Mission. He was also vice-president of the Upper Canada Bible Society, and in 1896 treasurer of the Armenian Relief Fund in Canada.

JOHN SIDNEY GRAY, M.D., C.M.

IN the death of Dr. J. S. Gray, who passed away on February 11th, Winnipeg has lost one of its most highly respected citizens and

the medical profession an able and devoted member. By his tenderness and skill Dr. Gray had endeared himself to a wide circle of patients in the province of Manitoba, and his zeal, ability, high ideals and devotion to his profession had won the esteem and affection of his colleagues and of all who knew him.

John Sidney Gray was born near Heckston, Ontario, on January 26th, 1850. He graduated from McGill University in 1876 and in 1881 went into practice at Winnipeg, where he was appointed to the staff of the General Hospital, an institution with which he retained his connexion up to the time of his death. After a few years spent in general practice, Dr. Gray went to England and from there to Europe to study gynæcology, and finally took a post-graduate course under Lawson Paige. Upon his return to Winnipeg he was offered and accepted the Chair of Gynæcology in the Manitoba Medical College, a post which he continued to occupy up to the time of his death. When the Manitoba Medical Council was formed in 1886, Dr. Gray was appointed Registrar and for almost thirty years he faithfully performed the numerous duties that fell to his lot in this connexion. He was also the representative of the medical college on the University Board of Studies. Upon the formation of the Medical Council of Canada in 1912, Dr. Gray was unanimously chosen to represent the Manitoba Medical Board upon the Dominion Council. He also acted for many years as medical officer of the Canadian Order of Foresters and as examiner for the Sovereign Life Insurance Company. Dr. Gray was a keen student and contributed a number of articles upon gynæcology to medical literature. He leaves a widow, one son and two daughters.

DR. WILLIAM OLDRIGHT

THE death occurred at Chicago on January 2nd, of Dr. William Oldright, of Toronto, one of the oldest graduates of the medical faculty of Toronto University, a brilliant scholar and a successful practitioner for almost half a century. William Oldright was born at St. Kitts, in the British West Indies, in 1843, the son of Major John Oldright and Elizabeth Clucas Oldright. He was educated at the Free Church Academy at Halifax and the Brantford Grammar School and entered the University of Toronto as a student in the faculty of arts, graduating in 1863. He then entered the medical school, from which he graduated M.B. in 1865 and two years later obtained the degree of Master of Arts. In 1869 he became a member of the Ontario College of Physicians and Surgeons, and in 1882

chairman of the Provincial Board of Health. For many years Dr. Oldright was Associate Professor of Clinical Surgery and Professor of Hygiene in the University of Toronto, and was also a member of the Senate of the University. He was at one time vice-president of the Children's Aid Society and always evinced the keenest interest in the promotion of the public welfare. He was associated with St. Michael's Hospital as a member of the surgical staff for many years. He is survived by a widow, five daughters, and two sons.

DR. NAPOLEON ROBILLARD died at Montreal on January 31st, in the ninety-first year of his age. He was educated at L'Assomption College, Montreal, and received his license to practise medicine in 1854. He practised for a number of years at Ste. Genevieve in the province of Quebec and became mayor of that village and warden of the county of Jacques Cartier.

DR. LOUIS PROSPER BENDER died at Quebec on January 25th, after a short illness. After receiving his early education at the Quebec Seminary, Dr. Bender graduated from McGill University in 1865 and later was admitted to the College of Physicians and Surgeons of Ontario. He served with the Northern Army during part of the American Civil War. Upon his return to Canada he took up the practice of homeopathy at Quebec. Dr. Bender had a strong literary bent and was a frequent contributor to various periodicals. Among the best known of his writings were a series of Biographical Sketches of prominent men of Quebec, "Literary Sheaves" published in 1881, and "Old and New Canada" which appeared the following year. In 1884, Dr. Bender went to reside in Boston and did not return to Quebec until 1908.

DR. THOMAS LISTER died at Rosevear, Alberta, on January 20th in the fifty-first year of his age. Dr. Lister came to Canada from Wisconsin about two years ago and took up practice at Rosevear.

DR. JAMES EATON ROBERTSON died suddenly at Midvale, Utah, on February 4th. He was born in Prescott, Ontario, in 1872 and graduated from McGill University in 1895. He enjoyed an extensive practice in Utah and was medical officer of health at Midvale and a member of the State Board of Education.

THE tragic death of Dr. Herdmin occurred at River Hebert, Nova Scotia, on Saturday, February 10th. The young physician had been at River Hebert for about a year, having taken over the practice of Captain J. A. Munroe, C.A.M.C., medical officer of the 185th Battalion. Dr. Herdmin had been to visit a patient at Strathcona, which is about a mile from River Hebert, and was walking along the railway track on his way home when he was knocked down by an engine, ground beneath the wheels, and dragged for a distance of one hundred and fifty feet. As there was a high wind at the time, it is presumed that Dr. Herdmin did not hear the engine. He was the son of the late Mr. Herdmin, a clergyman of Pictou County, and is survived by his mother, who lives at Halifax, a widow, and one child.

DR. A. A. NICHOLLS, of Edmonton, died suddenly on February 16th. Dr. Nicholls graduated from the University of Manitoba in 1902 and had been in practice at Edmonton for some years.

DR. J. R. STEEP, of Winnipeg, died last December at the age of fifty-seven years. He was born at Clinton, Ontario, and was appointed medical adviser in the Department of Indian Affairs.

DR. THOMAS W MUSGROVE, who died at Sultan, Washington, on January 22nd, in the sixty-seventh year of his age, was born at Wickham, Queen's County, New Brunswick. Dr. Musgrove was a graduate of the Harvard Medical School and was in practice at West St. John, New Brunswick, from 1879 to 1889. He was a frequent contributor to literature, both lay and medical.

News

MARITIME PROVINCES

FROM the 6th Annual Report of the Chief Health Officer of St. John, New Brunswick, we learn that the health of that city during the year 1916 has been most satisfactory. With the exception of measles, there has been a pronounced decline in the number of acute notifiable diseases as compared with the previous twelve months. There were two outbreaks of measles during 1916, in

April and in October, and it is probable that many cases occurred that were not reported. The following cases of notifiable diseases were reported during the year: diphtheria, 57 cases, 3 deaths; scarlet fever, 16 cases, 1 death; typhoid fever, 22 cases, 4 deaths; measles 223 cases, 5 deaths; tuberculosis, 139 cases, 63 deaths; typhus fever, 8 cases. Manifest improvement has taken place in the incidence of tuberculosis; in 1914 the death rate from all forms of the disease was 186 per 100,000, and in 1916 it had fallen to 127.26 per 100,000 population. The improvement in the death rate from pulmonary tuberculosis was even more marked, falling from 170.91 in 1914 to 107.06 in 1916. The infant mortality is estimated at 118.8 per thousand births, which also compares favourably with that of 1914 when it was 173.98. The total death rate of the city was 16.41 per thousand, estimating the population at 49,480, the number of deaths being 808. The Isolation Hospital which was destroyed by fire a short time ago, has been replaced by a new and modernly appointed building.

THE new armory at St. John, New Brunswick, which was completed just before the commencement of the war, has been taken over by the Military Hospitals Commission and converted into a hospital of five hundred beds.

ONTARIO

THE sittings of the Medical Commission under Mr. Justice Hodgins were resumed on January 29th.

DR. T. L. McRITCHIE has been appointed medical officer of health of Chatham in succession to Captain George Musson, C.A.M.C., who is on active service.

OF 1,293 children medically examined in the Toronto schools during the month of January only 334 were found to be without physical defect. Three hundred and twenty-three were suffering from carious teeth only.

During the year 1916 patients to the number of 136 were treated in the Lady Minto Hospital, Cochrane. Eight deaths occurred.

It was decided at the annual meeting of the Hamilton Hospital Board that as the new hospital, which will be completed next May,

will not be filled for some time, the rooms not required immediately should be lent to the Hospital Commission for the accommodation of returned soldiers. It was reported at this meeting that during 1916, 6,849 patients had been admitted to the hospital, or 957 more than during the previous year. The number of patients treated in the public wards and the outdoor department was rather less than in 1915, due no doubt to improved conditions among the poorer classes.

THE plans for an isolation hospital to be built at Windsor are in course of preparation and will be laid before the city council with a strong recommendation that such a hospital be built in the near future.

THE annual meeting of the Peterborough Health Association took place on January 19th. The year's work has been accomplished under unusual difficulties on account of the war, but in spite of that much has been done. During the twelve months under consideration 187 patients have been visited by the district nurse, the total number of visits made being 2,050 of which 548 were paid for by the patients. Twenty-nine tuberculous patients were under observation and daily treatment was given in six cases. Milk, eggs, drugs and medical supplies were distributed to a number of families.

THE members of the Provincial Board of Health appointed for the year 1917 are Dr. Adam Wright of Toronto, chairman, Dr. A. A. Weagant, of Ottawa, Dr. T. E. Kaiser of Oshawa, Dr. J. Roberts of Hamilton, Dr. W. H. Howie of Sudbury and Dr. H. R. Casgrain of Windsor.

It is announced that the city council of Toronto has decided to apply to the Ontario Legislature for permission to issue debentures to the extent of \$150,000 for the erection and equipment of buildings for the care of the feeble-minded.

QUEBEC

THE annual meeting of the Board of Governors of the Verdun Hospital for the Insane was held on January 7th. During 1916 patients to the number of 962 were given treatment in the hospital as compared with 911 during the previous year, and on December

31st, 1916, there were 766 patients in the institution, including about an equal number of men and women. Twenty returned soldiers were admitted during the year, thirteen of whom were still under treatment at the time the report was written. Of the patients admitted 109 were Canadian born. The principal cause of insanity, in the opinion of the medical superintendent, Dr. Burgess, was mental anxiety. Drink and drugs were responsible for a certain proportion, as were also such factors as heredity, senility, vice and so on. Sixty-one deaths occurred during the year, general paresis being the most frequent cause. The work of the institution has been hampered through lack of sufficient accommodation, the normal capacity being 700. The addition of a nurses' home, which has been built during the past year, has ameliorated conditions to some extent.

THE use of the water of Lake St. Louis for drinking purposes came up for consideration at a recent meeting of the Superior Board of Health of the province of Quebec. A number of reports were submitted to the Board, which showed that the water from the lake was not fit to drink unless properly filtered, and an order was issued to the towns of Ste. Anne de Bellevue, Pointe Claire, and Dorval to instal filtration plants before next October. It was decided to take up the question of the water supply of Lachine at a subsequent meeting of the Board. A request made by the city of Hull, that the order to instal a filtration plant be suspended, was refused, the Board being of the opinion that chlorination of the drinking water as now practised was a temporary measure only and at times non-efficacious. Moreover, the Board considered that the financial position of Hull was such as to permit of the installation of a proper filtration system which would ensure a supply of pure drinking water.

The Board signified its approval of the following amendments to the Quebec Public Health Act:

1. Plans for waterworks, filters, sewerage systems, and sewage disposal submitted to the Superior Board of Health to be prepared by engineers qualified to practise in the province.
2. That no by-law providing for the raising of money for the construction, alteration, or extension of any works coming under the jurisdiction of the Board of Health be submitted to the votes of the electors without first being approved by the Board of Health.
3. That extensions or alterations to existing works be submitted to the Board of Health for approval.

4. That rules should be drafted to cover the preparation and submission of projects.

MANITOBA

THE annual report of the Manitoba Board of Health was presented to the provincial government on January 24th. The report was of more than usual interest and contained several important suggestions, namely, that following the example of Ontario the province of Manitoba should be divided into sanitary districts, each in charge of a properly trained medical officer who would devote his whole time to public health work in that district, that the position of health officer should have a greater degree of permanency and the remuneration should be based upon the population of the area under his control, that a voluntary organization of health officers of the province should be founded with a view to consultation and united action in the adoption of the most approved modern methods of health work, and that the necessary steps should be taken to regulate the supply of meat and milk throughout Manitoba. The importance of vital statistics was pointed out and the necessity of sending in proper returns insisted upon; at present such returns are made intermittently and therefore are of no practical value. The report states that of 5,000 children examined in the public schools, 1,260 were found to require medical or dental attention.

The annual meeting of the board of governors of the Brandon General Hospital took place on January 15th. During the past year 1,900 patients were admitted to the hospital which was occupied to its full capacity throughout the year and at times overcrowded. From a financial standpoint, the year 1916 was a good one.

SASKATCHEWAN

DR. ARMSTRONG, of Kingston, Ontario, has been appointed house surgeon of the Regina General Hospital in succession to Dr. de Martini.

BRITISH COLUMBIA

At a meeting of the Board of Directors of the Vancouver General Hospital on January 25th, communications were read from a number of hospitals in the province referring to a convention of the hospitals of British Columbia which it is proposed to hold in

the near future. The matter was referred to the incoming board for further consideration.

SUBSCRIPTIONS to the amount of over \$20,000 have been received towards the \$35,000 required for the military hospital which it is proposed to build at Vancouver.

MEDICAL COLLEGES

McGill University

A SPECIAL convocation took place at McGill University on February 6th, in order that the degrees of M.D. and C.M. might be conferred upon those students who had taken the special course in medicine commenced last summer so that they might graduate and enlist for overseas service as soon as possible, and who had been successful in passing the examinations held upon the termination of the session. A high standard of efficiency has been maintained throughout the session and out of fifty-three candidates forty-three were successful in passing the examinations. The following are the names of the successful candidates:

Henry Baby, Chatham, Ont.; C. H. P. Benning; S. D. Bernard, Spanish Town, Jamaica, B.W.I.; A. Bissember, Berbice, British Guiana; E. M. Blair, Truro, Nova Scotia; A. W. Brodie, Smith Falls; J. F. L. Brown, Middle Southampton, N.B.; B. L. Cahanna, Montreal; H. B. Church, Aylmer East; H. St. G. Clarke, St. John; F. J. Coughlin, Montreal; Edward Craig, North Gower, Ont.; Albert Desparois, Montreal; F. N. K. Falls, Ottawa; A. F. Gillis, Miscouche, P.E.I.; K. G. Grant, Bristol, England; W. Halpenny, Galetta, Ont.; R. C. Hastings, Malone; F. A. Johnson, Oshweken, Ont.; J. R. Laing, Montreal; A. S. Lamb, Ballarat, Australia; R. G. Lawrence, Revelstoke, B.C.; E. W. Lunney, St. John; O. O. Lyons, B.A.; Waterville, N.S.; John MacDonald, Stratford; W. F. MacIsaac, Antigonish, N.S.; O. V. Marsh, Jamaica, B.W.I.; L. M. Matthews, Port Arthur; J. D. Moore, Victoria; J. R. Nugent, B.A., St. John; J. B. O'Reilly, St. John's, Nfld.; V. H. T. Parker, Belle Isle, N.S.; C. E. Pengelley, Jamaica, B.W.I.; T. E. Perez, San Domingo, W.I.; G. G. Phillips, Cornwall; I. M. Rabinovitch, Toronto; T. M. Richardson, B.A., Balderson, Ont.; J. D. Robinson, Saskatoon; F. J. Scully, B.A., St. John; M. H. Sacksner, Montreal; H. P. Swancesky, New Westminster; H. L. Warshawsky, B.A., Montreal; T. G. Wolff, B.L., Montreal.

The degrees of M.D., C.M., were also conferred upon the following gentlemen who completed their medical studies in September last: F. E. Gullison, of Yarmouth, Nova Scotia; H. T. Jost, B.A., of Guysboro', Nova Scotia; W. H. Miller, of Victoria; and W. J. Stevens, of Arnprior, Ontario.

The honours are as follows:

Aggregate of all subjects: 1, O. V. Marsh; 2, T. M. Richardson, B.A.

Medicine: 1, T. M. Richardson, B.A.; 2, W. F. McIsaac; 3, R. C. Hastings; 4, G. G. Phillips.

Surgery: 1, O. V. Marsh; 2, T. M. Richardson, B.A.; 3, R. C. Hastings

Obstetrics: 1, O. V. Marsh; 2, J. D. Moore; 3, A. S. Lamb.

Gynaecology: 1, I. M. Rabinovitch; 2, Henry Baby; 3, A. S. Lamb and J. D. Moore; 5, T. M. Richardson, B.A.; 6, G. G. Phillips.

Ophthalmology: 1, J. D. Moore; 2, M. H. Sacksner; 3, C. H. Benning and C. E. Pengelley.

Oto-laryngology: 1, J. D. Moore 2, W. Halpenny and F. A. Johnson; 4, J. McDonald.

Pathology: 1, E. W. Lunney; 2, F. N. L. Falls; 3, K. G. Grant; 4, A. S. Lamb; 5, J. D. Moore; 6, J. Dean Robinson; 7, E. E. Rogers; 8, F. J. Scully; 9, R. C. Hastings, and T. E. Perez.

ARMY MEDICAL SERVICES

THE appointment is gazetted of General Guy Carleton Jones, C.M.G., as Inspector-General of the Canadian Medical Service in Canada, England, and France, and of Colonel Gilbert Lafayette Foster, C.B., as Director-General of the Canadian Medical Service. Colonel Foster has served with distinction as A.D.M.S. of the First Canadian Division, and later as D.D.M.S. of the Canadian Expeditionary Force in France.

COLONEL HERBERT A. BRUCE, C.A.M.C., of Toronto, is reported to have been appointed Consulting Surgeon with the British Medical Services in France.

MAJOR A. J. AMYOT, C.A.M.C., Director of the Ontario Board of Health Laboratories and Professor of Hygiene in the University of Toronto, who went to the front with the Toronto University Base Hospital, has been appointed Sanitary Adviser in England to the Canadian Forces.

THE Military Cross has been awarded by His Majesty to CAPTAIN WILLIAM MALLOCK HART, C.A.M.C., "for conspicuous gallantry and devotion to duty. He displayed great courage and skill in evacuating wounded under most trying conditions. On one occasion he worked for several hours in the open under heavy fire attending to the wounded. He has previously done fine work."

SERGEANT-MAJOR E. DAVIS, C.A.M.C.

CAPTAIN ADAM F. MENZIES, R.A.M.C. Captain Menzies graduated as gold medalist from the Manitoba Medical College and soon after the outbreak of war joined the Royal Army Medical Corps. He was severely wounded last December. Before going to the front he served for a year as house surgeon in the Winnipeg General Hospital.

THE following promotions have been gazetted in the Canadian Army Medical Corps: To be Lieutenant-Colonel: Dr. J. L. Chabot, M.P., of Ottawa. To be temporary Lieutenant-Colonel: Major G. R. Philip. To be Major: Captain J. N. Gunn, of Calgary. To be temporary Captain: C. D. Rilance, M.B. Late temporary Lieutenants R.A.M.C. to be temporary Captains: L. M. Morton and O. G. Donovan.

CAPTAIN W. C. L. MCBETH, C.A.M.C., who recently returned from the front, has been appointed medical officer in charge of the Hamilton Military Hospital in succession to Major D. G. McIlwraith, C.A.M.C. Captain J. A. MacCallum, C.A.M.C., who has also recently returned from the front, has been appointed assistant to Captain MacBeth. It will be remembered that the Military Cross was awarded to Captain MacCallum last June on the occasion of the King's Birthday.

CAPTAIN E. C. WILFORD, C.A.M.C., who recently left Toronto for service overseas, returned to Canada a short time ago from Tzeliutsing, West China, where he has been for the past eight years. Dr. Wilford was born at Blyth, Ontario, and graduated from Toronto University. He afterwards did post-graduate work in London and Edinburgh, and was subsequently sent by the Methodist Church of Canada as a medical missionary to Tzeliutsing, a city of about a million inhabitants but at that time without a hospital of any kind. During his stay in Tzeliutsing Dr. Wilford was able to collect subscriptions to the amount of \$10,000 in Chinese currency, for a hospital which was almost completed before he left China. He also organized Red Cross work in Tzeliutsing.

THE appointment is announced of Colonel J. A. Roberts, C.A.M.C., as Commandant of the Duchess of Connaught Canadian Red Cross Hospital at Cliveden.

LIEUTENANT-COLONEL W. M. HART, C.A.M.C., of Regina, who was a prisoner in Germany for some months, is now attached to the staff of the Granville Special Canadian Hospital at Ramsgate. Major Robert Wilson, C.A.M.C., of Montreal, is also on the staff of that hospital.

CAPTAIN SCRIMGER, V.C., C.A.M.C., of Montreal, is now at the Headquarters of the Canadian Medical Services in London as examining officer for the medical board.

LIEUTENANT W. H. LLOYD, C.A.M.C., has been appointed medical officer of the 235th Battalion.

LIEUTENANT ELLIS, C.A.M.C., is on duty as medical officer at the 77th Battery Depot at Regina.

THE following physicians have been appointed members of medical boards for the examination of recruits in the province of Saskatchewan: District of Melville—Dr. D. R. Livingstone and Dr. Crosby. District of Estevan—Lieutenant R. N. Tripp and Dr. French. District of Watrous—Dr. W. E. Hixon, Dr. Wm. Y. Cook, and Dr. S. Mathieu. District of Yorkton—Captain C. M. Henry, Dr. T. A. Patrick and Dr. Broughton. District of Maple Creek—Dr. Alexander Fettes and Dr. F. B. Dawson.

CAPTAIN F. R. NICOLLE, C.A.M.C., has returned to Chatham, Ontario, on sick leave. Captain Nicolle contracted trench fever at the front and has been in hospital in England for some time.

CAPTAIN A. H. DAVIES, R.A.M.C., of Vancouver, who was formerly in practice at Delhi, Ontario, is surgeon on the hospital ship *Guildford Castle* which is plying between East African ports and Capetown.

No. 8 Canadian Stationary Hospital, under the command of Lieutenant-Colonel H. E. Munroe, C.A.M.C., of Saskatoon, is stationed at Hastings and has taken over the Canadian Military Hospital there.

DR. FRED ADAMS, epidemiologist to the Toronto Board of Health, has left for overseas service.

No. 4. Canadian Casualty Clearing Hospital has been transferred from Shorncliffe to Ramsgate.

THE Royal Red Cross of the First Class has been awarded to Matrons H. Casault, E. C. Rayside, E. Russell, and M. Smith. This Order of the Second Class has been given to Nursing Sisters E. L. Bell, E. Boulton, C. Cameron, M. Clint, E. Drysdale, M. P. Ellis, M. C. English, H. L. Fowlds, A. M. Gallop, G. A. Gray, H. Harvey, L. Holland, C. Hood, M. Howe, A. E. Johnston, J. Johnstone, M. MacAffee, H. A. MacLaughlin, M. R. Marsh, G. H. Mavety, N. C. McCurdy, G. B. McPherson, M. Motherwell, E. F. Pense, J. Robertson, M. Rose, I. B. Smith, I. D. Strathy, and F. H. Wylie.

CASUALTIES

Died

CAPTAIN W. W. MCKENZIE, C.A.M.C., 66 Melbourne Avenue, Toronto.

Injured

CAPTAIN HAMILTON, C.A.M.C., of Revelstoke, British Columbia. [Captain Hamilton, who is the medical officer of a Kootenay Battalion, was injured by a motor lorry while his battalion was in rest billets after safely passing through the battles of the Somme. He has been invalided to Canada.

Ill

MAJOR D. B. BENTLEY, C.A.M.C., of Sarnia, Ontario.

Canadian Literature

ORIGINAL CONTRIBUTIONS

The Canadian Practitioner and Review, January, 1917:

Presidential address	P. H. Bryce.
Osteitis deformans	C. Sheard.

The Canadian Practitioner and Review, February, 1917:

- Heat as a method of treatment in some
forms of cavity carcinoma F. P. Percy.
The Toronto Reception Hospital H. Clare.
Cæsarean section—clinical case F. C. Stevenson.

The Canadian Journal of Medicine and Surgery, January, 1917:

- University Hospital, Ann Arbor. The
Psychopathic Pavilion J. N. E. Brown.
An improved formula for the preparation
of Dakin's solution. N. A. Powell.

The Canadian Journal of Medicine and Surgery, February, 1917:

- Hypochlorous acid in surgery C. H. Gilmour.

The Western Medical News, December, 1916:

- Eclampsia Geo. P. Bawden.

The Canada Lancet, December, 1916:

- The law and the doctor W. R. Riddell.
On the selection of an operation for enuclea-
tion of the eyeball G. Sterling Ryerson.

The Canada Lancet, January, 1917:

- The protein poison in immunity and
disease Victor C. Vaughan.
Corrigan's investigations on the cardio-
vascular system. W. Ewart Ferguson.

Medical Societies

PERTH COUNTY MEDICAL ASSOCIATION

THE annual meeting of the Perth County Medical Association took place at Stratford, Ontario, on February 8th. The officers elected for the year 1917 are: President, Dr. A. D. Smith of Mitchell; vice-president, Dr. A. A. Knox of St. Mary's; secretary-treasurer, Dr. F. J. R. Forster of Stratford; local secretaries: Stratford—Dr.

Gemmell; St. Mary's—Dr. J. R. Stanley; Mitchell—Dr. Armstrong; Listowel—Dr. Nichol. A resolution was passed to the effect that the provincial government be requested to define the meaning of the words "practice of medicine", and to prevent the use of the title "doctor" by unauthorized persons. A resolution was also passed in favour of amalgamation with the Ontario Medical Association.

SASKATCHEWAN MEDICAL ASSOCIATION

A SPECIAL meeting of the Saskatchewan Medical Association took place at Regina in December last, to discuss certain proposed legislation mentioned in a communication from the Premier of the province. A report was presented by the committee appointed at the last annual meeting of the Association to consider the question of the provision of medical attendance for settlers in sparsely populated districts of the province, to the effect that a set of resolutions had been drafted and presented to the Department of Municipal Affairs at Regina. It was resolved that the Council of the College of Physicians and Surgeons should be requested to proceed at once to have a survey made of the medical profession of Saskatchewan with a view to consultation, so as to improve and increase efficiency.

PETERBOROUGH MEDICAL SOCIETY

A MEETING of the Peterborough Medical Society was held on February 8th, at which a most interesting and instructive paper was given by Dr. Moir of Peterborough, entitled "Ulcers of the Stomach and Duodenum, with report of Cases." After the discussion which followed, a hearty vote of thanks was tendered to Dr. Moir.

The next meeting will be held on March 2nd.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE third regular meeting of the society was held Friday November 3rd, 1916, Dr. W. S. Morrow, president, in the chair.

LIVING CASE: Dr. R. J. Ericksen of the Royal Victoria Hospital presented a living case of Vaquez's disease.

DISCUSSION: Dr. Maude E. Abbott. I would like to know whether the white cell count is usually increased in these cases and whether if it is, that may not be a differential point in the diagnosis

of these polycythæmias from such as occur in high altitudes and general cardiac disease. I would also like to ask how long do these cases last? Dr. O. S. Hillman, one of our graduates, now connected with the Post-Graduate School of New York, sent us up two or three years ago a large full-sized slice of a spleen, removed by splenectomy, from one of the cases studied by Dr. Osler, and upon which his study of this so-called "Osler's disease" was based.

Dr. C. F. Martin: The leucocytosis is rather peculiar to this condition but the essential feature of diagnosis is the enlarged persistent spleen. The duration is often long, one case lasted thirteen years and another nineteen.

PATHOLOGICAL SPECIMENS: Series of Dr. Horst Oertel.

1. This specimen of liver carries the weight of an experiment. It is from an old man who entered the Royal Victoria Hospital to have a prostatectomy done; no one had any idea that there was anything else the matter with him save an enlarged prostate. The operation was to be done in two stages; unfortunately he died shortly after the first stage though the operation was itself successful. At autopsy there were found evidences of senility and no particular cause of death. But a most remarkable condition was disclosed in connexion with the liver. The common bile duct of the liver was obstructed by numerous stones, with a very large egg-shaped one embedded deeply in the mucous membrane of the ampulla, so that it is hard to imagine how this stone could have been movable. Above it were other larger and smaller stones, apparently tightly blocking the common bile duct. The hepatic duct was also blocked by a number of stones and going up farther in its first branches to the right and left lobe of the liver were found more stones within dilated ducts. In the gall bladder itself were a large number of stones. Now it seems that the blocking by these stones must have been practically complete, and yet there did not exist in this case any jaundice at all and further examination proved that the liver did not show any evidence of bile stasis, save a moderate dilatation of the biliary ducts in the portal spaces.

I will not go into a theoretical discussion of the causes of jaundice, but it is of very great importance to know that a complete blocking of the common duct, of the hepatic duct and of the primary branches of the hepatic duct may occur without appreciable symptoms and especially without any jaundice. Microscopically the liver shows cystic dilatation of interlobular bile ducts, but no cholangitis, pericholangitis and no inter or intralobular bile stasis. There were further no capillary bile thrombi and no bile pigmen-

tion within the lobules. (It is proposed to report this case in detail later.)

2. This second specimen of another liver is of considerable interest and importance to-day as it concerns the anatomical findings in trinitrotoluene poisoning of which a considerable number of cases have occurred recently and are still occurring in connexion with ammunition work. This concerns a young man, a medical student, who during July and August worked for about six or eight weeks in ammunition works. He was exposed to the trinitrotoluene fumes and also did a thing which, I have since learned, is occasionally indulged in by these workers—he exposed himself voluntarily to the vapours of toluene producing the effect of an intoxication. Like other cases, he developed jaundice and on account of increasing weakness left the works. He improved so much that in the autumn he returned to college, though still slightly jaundiced and even reported for military service, but was advised by the physical examiner to abstain from this exercise for some time. Suddenly, on October 18th, he was taken ill with profuse hæmorrhages from the nose and also from bowels and kidneys. He went down extremely rapidly after entering hospital, collapsed and died within forty-eight hours of admission. Autopsy disclosed the following interesting findings which throw light on the nature of this poisoning. In the first place there are diffuse and profuse hæmorrhages in practically all the parenchymatous organs. The whole pelvis of the kidney as well as the ureter were blocked by coagulated recent blood; there were hæmorrhages (ecchymoses) in the skin, pericardium and intestines. The left lobe of the liver is very much diminished in size, collapsed, flat, extremely hæmorrhagic so that all markings have disappeared. The right lobe is enlarged and presents an interesting and most peculiar picture.

It shows a tremendous parenchymatous swelling which is greyish, not yellowish and fatty as seen in the toxic atrophies of the liver, and this swelling has produced a peculiar relief-map appearance of the parenchyma around depressed vascular channels. On microscopic examination two or perhaps three stages of the process may be recognized, the first one is represented by a tremendous œdematous imbibition and swelling which separates the liver cells widely and ultimately produces an œdematous solution of these cells, but without any parenchymatous degeneration or fat infiltration; the liver cells as a result of this cytolysis simply dissolve as in prolonged venous stasis. The necroses which are both central, and peripheral, are primarily streaky and by confluence produce a

striking picture separating preserved tissue. It appears that by extension all liver tissue collapses entirely and a profuse hæmorrhage occurs into collapsed areas; this latter stage is shown in the left lobe where all structure is gone, and lobular differentiation is lost. Finally as a last stage it appears that as in the acute yellow atrophies a periportal lymphoid infiltration takes place which extends from the periphery of the lobule to the hæmorrhagic centre and displays numerous capillary bile ducts.

Now the interpretation which I base upon these findings is that trinitrotoluene is not a parenchymatous poison proper, but a vascular one injuring the endothelium of blood vessels and lymphatics. As a result of this nutritive interference massive oedema results which brings on cytolytic necrosis and free hæmorrhages into the collapsed area which ultimately replace the liver tissue. In some of the later pictures of the hæmorrhagic stages a resemblance to acute yellow atrophy is noticeable, but it can be easily differentiated by the features just described. Noteworthy is especially absence of fatty changes, coagulation necrosis and lack of marked bile precipitation. (This case will be reported in detail later by Dr. Odland). The specimen was illustrated by lantern slides.

DISCUSSION: Dr. E. H. Mason: The post-mortem findings in this latter case throw a great deal of light upon another case we now have for treatment. The man after working continuously for twenty-four days in the crystallizing plant of a powder factory was noticed to be jaundiced by the physician in attendance. Otherwise he suffered only stray indefinite abdominal pains. He was sent to hospital but we could not make out very much except this slight degree of jaundice; barium meal test showed adhesions between stomach wall and gall-bladder region. Since then he has developed a generalized oedema, above the diaphragm as well as below; it appeared first in the legs, then free fluid developed in the abdominal cavity and in both pleural cavities as well as oedema of the arms. If this poison acts on the endothelial lining of the lymphatics and the small arterioles, as it seems to do, it throws a great deal of light upon the development of these cases. The man's heart is perfectly good, normal size, blood pressure normal, pulse rate good, no increase, electrocardiogram shows no degeneration of the heart muscle and we have come to the conclusion that the general oedema is the result of the trinitrotoluene chemical.

The patient from whom Dr. Oertel's specimen was taken entered hospital on the 18th with a history of, twenty-four hours

before having hæmorrhage from his nose, then two from his bowels, and on admission to the hospital two more from the bowels, although not enough to cause marked anæmia. Two subcutaneous hæmorrhages were noticed on the left thigh. There was complete anuria due to massive hæmorrhages in the pelvis of both kidneys. On catheterization 5 c.c. of urine showed a great deal of blood; no crystals of tyrosine or leucine. The liver dulness was not decreased and there was no free fluid in the abdominal cavity at 6:30 p.m., but at 12 o'clock the heart showed complete collapse, the pulse rate went up, heart weak and rapid. Under stimulation he lived until 6:30 in the morning, when he died.

Dr. Lautermann: I would like to ask if Dr. Oertel has any suggestion to make as to the cause of the dissolution in that first case with the stones in the liver.

Dr. H. A. Lafleur: I presume that it is not intended to convey that all these cases are necessarily fatal. I imagine it is a case of time of exposure, etc. One case I saw this year made to all intents and purposes a good recovery, and nothing could be made out in the examination before he left the hospital to suggest that he was going to come to a speedy end. All the organs seemed to be sound and yet there was no doubt that it was a definite case of poisoning from this chemical. He had an intense jaundice, the kind you get from a complete obstruction of the bile duct; it lasted much longer than catarrhal jaundice and was accompanied by a good deal of depression with gastro-intestinal distress, but he made a good recovery. I would like to know if, in the experience of those who have seen much of this condition, the impression is general that these cases are always ultimately fatal, or whether it is possible to recover.

Dr. Horst Oertel: With regard to Dr. Lautermann's question as to the exact and direct cause of death in the first case, we had nothing to suggest it beyond the fact that he was an old, poorly-nourished man with advanced visceral senile changes, but there was nothing to show the immediate atrium mortis.

PAPERS: 1. Transfusion of blood, by Dr. C. K. P. Henry. (This paper appeared in the January number of the JOURNAL.)

2. Longitudinal sinus transfusion in infancy, by O. M. Tarr. (Published in this issue.)

DISCUSSION: Dr. E. W. Archibald: I was very much interested in Dr. Henry's paper and must congratulate him on such a successful series of transfusions. Possibly the members might be interested in a short account of the transfusions we did on the other

side during the past eighteen months. We had a series of nine, or rather, ten in nine patients. Two of these were under Major Hill's care. Very briefly the results were as follows: there were of secondary hæmorrhage five cases. All were moribund; no transfusion was done unless obviously there was no chance of saving life otherwise. All were pulseless or practically so. Secondary hæmorrhage in infected wounds was our greatest bugbear. Of these five cases two were saved. In the three others, although there was marked immediate improvement with return of colour and of pulse, relief of the lethargy of acute anæmia, yet death took place from repeated hæmorrhages. Transfusion of whole blood does not in secondary hæmorrhage give you sufficient clotting to prevent a recurrence of hæmorrhage. There were four other cases in which transfusion was done; in two it was for serious hæmorrhage combined with severe infection. These were done at a casualty clearing station, and both died of gas gangrene in twenty-four hours, although an immediate improvement had been marked. In two others, abdominal injuries with severe shock, the patients likewise died. These two shock cases were in marked contrast to those suffering from hæmorrhage in that there was no sign whatever of improvement following the transfusion. I came to the conclusion, which I believe Libmann and Ottenberg of New York had also formed, that transfusion of blood in cases of shock is valueless. As a matter of fact one really ought not to expect much improvement in shock, because that clearly is some upset of the rhythm of circulation and is not essentially due to loss of volume of blood. In these cases of shock then, not combined with hæmorrhage, it is probably useless to do transfusion.

Of the nine cases only two recovered; but in the others the transfusion was negatived by conditions over which control was quite impossible,—recurrence of hæmorrhage, shock and gas gangrene. Of course the free use of transfusion in the army is discouraged by some commanding officers because of the risk of disabling the donors. The donors are usually men with slight disabilities who might otherwise very quickly be returned for duty, say a sprained ankle or a slight wound; and who might, if there was a possible chance of making anything out of the loss of blood, claim a week or two weeks' leave. Consequently commanding officers are not very keen on risking donors who are needed as fighting men, unless the chance of success is reasonably sure.

Apart from this personal experience I have had knowledge of the experience of others concerning the use of the method for

chronic sepsis; I refer to that type of chronic fever which persists although the wound is perfectly drained, and where evidently there is lack of resistance. Transfusion has been found in quite a number of these cases to do good, apparently through the addition of hæmoglobin. Certainly chronic sepsis was in some instances fairly rapidly overcome, and I believe that in civil and hospital practice there will arise a considerable number of cases where this can be done. I used the Kimpton-Brown tube in five cases, and the citrated blood in the other four. In one of the cases of citrated blood, the patient after receiving three or four ounces lost consciousness, threw back his head, his eyes rolled up, breathing was slightly disturbed, and, if possible, he grew even more pale than before. We stopped transfusion and in five or ten minutes he came around and had no remembrance of having lost consciousness. The condition was probably due to isoagglutinins. Bruce Robertson of Toronto had one death, probably from hæmolysis. The evidence seems to be accumulating that if we select our cases properly and settle upon definite indications, the procedure, which is quite simple enough, is practically without danger and may very frequently be of great use.

3. Certain psychogenetic conditions in soldiers, by Major C. K. Russel.

THE fourth regular meeting of the society was held Friday, November 17th, 1916, Dr. W. S. Morrow, president, in the chair.

PATHOLOGICAL SPECIMENS: Series by Dr. J. W. Scott.

1. Lung: Pneumonia, due to infection with *Bacillus Mucosus Capsulatus*.

PAPER: The paper of the evening was given by Dr. D. H. Ballon on the complications of mastoiditis.

DISCUSSION: Dr. E. Hamilton White: I would like to congratulate Dr. Ballon on this interesting paper, and also on his successful operative cases, which I think form the most striking feature of his contribution. He has very clearly described the classical picture of the various complications and the fact that he is able to show us successful results following operative treatment of sinus thrombosis, will bring home to all the great advances that have been achieved in the surgery of this region. As he points out, early diagnosis and early operation are essential to success and we have to thank Dr. Gustave Alexander of Vienna for much brilliant work on this subject. In a large series of cases of sinus thrombosis he got as high as

60 per cent. recoveries in a condition formerly regarded as always fatal.

Unfortunately some cases are rather atypical and quite difficult to diagnose. I can remember several cases in Dr. Birkett's service at the Royal Victoria Hospital in the past eight years where there were decidedly atypical features, others were of more classical type. The proportion of these cases which recovered has been most encouraging. The point which should be impressed most forcibly in the question of the diagnosis of sinus thrombosis is the occurrence of a chill. That is the cardinal symptom and occurring during the course of an otitis should always suggest the presence of a sinus thrombosis.

The prognosis, even with early and skilful operation, depends upon the nature of the infection and the resistance of the patient. In chronic suppuration there is apt to be poor recuperative power as a result of prolonged absorption from the infected area and the results are apt to be unsuccessful. In acute infections the outlook is much better, especially if the patient has had robust health up to the time of the occurrence of the otitis.

As to the question of epidural abscess, in my experience the peri-sinus abscess is by long odds the most common form, as owing to the presence of the large cells at the tip of the mastoid it is very common to have abscess formation in this region. In these cases the bony walls of the cell are eroded and the lateral sinus forms one wall of the abscess cavity. Facial paralysis is not so very uncommon in the acute cases and the results are favourable if the pressure is quickly relieved. In chronic cases with destructive changes in the bone and long standing paralysis, a recovery of the nerve is not to be expected, but the indication for a radical mastoid operation to arrest the destructive disease in the bone is urgent.

DEMONSTRATION: Sphagnum moss as a surgical dressing.

Professor Porter showed specimens of the living moss and of dried and graded material, dressings already made up, jars containing specimens of the moss and others with absorbent cotton, in each of which had been placed an equal quantity of water to illustrate the absorbency of the two materials. Many slides also were shown, first of bogs, then of the plant itself, giving details of the various species, and then pictures illustrating the process of gathering the moss and preparing the finished material ready for use in the hospital.

DISCUSSION: Dr. H. A. Lafleur: It is not the custom of this society to move a vote of thanks to any of its members for a con-

tribution but I think we ought to make an exception in this instance and propose a vote of thanks to Professor Porter for his extremely interesting and instructive address on a very practical subject. This was seconded by Dr. von Eberts and unanimously carried.

Dr. E. W. Archibald: There is not much that I can say in discussing this subject except possibly from the purely surgical standpoint. Sphagnum moss was just coming in at Boulogne when I left; we had received a few dressings. As a matter of fact I had asked the operating room to get me some, but I had no chance to try them out. I have read one or two articles about it and from this, as well as what Professor Porter has taught us to-night, I feel that it is a valuable product, and as soon as arrangements can be made I hope some may be left in Canada for our use. The uses of the material are obvious. As Professor Porter has demonstrated, absorbent cotton is frequently not absorbent in that it soon reaches its limit, and dressings have to be changed very frequently. Again the cotton tends to retain pus, and makes the dressing a mere pus poultice. I should think the capillarity of this moss will make it an active drain and produce an active stream from the cavity to the exterior. I remember Sir Almroth Wright giving a very interesting demonstration of the active effect of the capillarity of the ordinary wick suspended as a syphon in a bottle of water; and I am sure that if we had wicks made of this moss we could soak fluid up to even greater heights than with the ordinary wick. Its uses then are quite obvious; and although I had no actual experience with it on the other side, I propose, as soon as the Red Cross can allow us to have any here, to make a trial of it.

Prof. J. B. Porter: Dr. Archibald spoke of making wicks of this moss. For some years now Germany has been using a coarse grade of moss for the purpose of protecting mines against dust explosions. Just before the war I brought from Germany samples of sphagnum linings for mine air ways. These linings are made by taking chicken wire netting and weaving two thicknesses of it together with a layer of an inch or more of pressed sphagnum between them. This is made in strips of say eight feet high, tacked against the walls of a place which it is wanted to make fireproof and damp, the foot of this lining rests in a gutter of water, with the consequence that the whole wall from the gutter up is kept wet.

An interesting coincidence this evening is that Dr. Symonds, after hearing me speak of how this moss grows on the moors on the Continent and in England and Scotland intermixed with the heather, the roots of which are often surrounded and embedded in

moss, mentioned that in a letter from his son, who is a prisoner in Germany, the son had stated that they had been collecting "heather" for the Germans. We know of no use for heather and it is more than likely that it is the moss they are after for surgical dressings and other purposes. The use of this as an old woman's poultice has been known for ages, but its use in scientific surgery, so far as we know, has only come within the last few years.

Dr. W. S. Morrow: I would like to ask Dr. Porter with regard to the possible supply of this material here. I would also like to thank him personally for bringing the subject before us in this extremely interesting way.

Dr. W. H. P. Hill. I have had no practical experience in the use of this moss but in conversation with an officer in France, who had used it, I was told that it had all the merits and something more of absorbent cotton. Where they had used it as a pad for splints it was more resistant and you did not get thinning out and consequent pressure on the fracture or whatever it may be the pad was protecting.

Professor Porter: It is rather difficult to say what our Canadian supply amounts to. We have an infinite quantity of poor sphagnum. I have examined about sixty bogs in different parts of the country and spent the better part of a summer and autumn, and have only found one or two in upper Canada where it was worth gathering. I have not of course attempted to go far north, especially at this time of the year. Also it was not until six weeks ago, about the middle of October, that Colonel Hodgetts informed us that the material had been accepted as a standard surgical dressing by the War Office and until we got some assurance like that the Red Cross could not commit themselves to asking for any supply on a large scale. In Quebec I have succeeded in finding it in one bog, back of Rivière du Loup. I have examined bogs all along the Nova Scotia coast from south of Halifax up to the extreme end of Cape Breton Island. Every bog close to the sea has some patches of it but I have never found a place where one per cent. of the bog was good sphagnum. However, even one per cent. of a large bog is a lot of moss and I do not see any difficulty in getting as much as we need. I doubt whether it would amount to a commercial proposition, but with volunteer workers preparing it for use by our hospitals there should be sufficient to see us through the war at least.

